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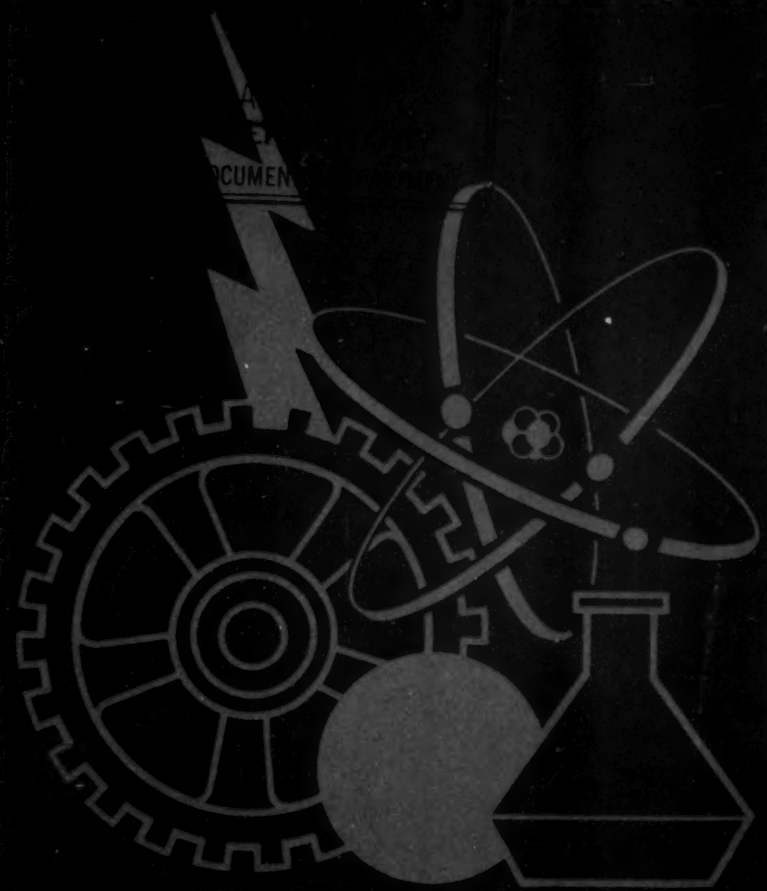

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 29, 1977 Volume 956 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Revised Procedures for Recording Searches and Considerations of Certain Prior Art

In order to provide a more complete, accurate, and uniform record of what has been searched and considered by the examiner for each application, the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO–892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. *"SEARCHED" Box Entries*

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass,* including all United States and foreign patent documents and other publications placed therein.

   The complete classification (class and subclass) will be recorded.

2. *A limited search of a subclass,* for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B. 4 below.)

   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.

3. *An update of a search previously made.*

   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.

   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. ————————)" will be recorded. If the parent has been patented, the patent number "Pat. N. ————————" instead of serial number in the above phrase will be recorded.

4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO–1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. The examiner will place one copy of the form PTO–1041 in the application file on the right flap of the file jacket, the other copy of the form PTO–1041 will be forwarded to the Office of Search Systems.

When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. *"SEARCH NOTES" Box Entries*

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search,* or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant.

   The classification will be recorded, followed by "(Cursory)."

2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise.

   The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.

3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:

   a. *Abstracting publications,* such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index, and the period covered will be recorded.

   b. *Periodicals*—The title and period or volumes covered, as appropriate, will be recorded.

   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.

   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.)

   Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.

   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.

   There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service. These search systems include many data bases.

   A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

   The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.

4. A search of only the *publications in a subclass.*

   The class and subclass followed by "(publications only)" will be recorded.

5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention.

   The serial number of a parent application that is still pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted.

   The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. *Not Recorded*

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below.

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*

   In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.

2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*

   In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Date: 2–22–77.

December 1976 and January 1977 Classification Orders

The reclassifications covered by the following classification changes became effective during December 1976 and January 1977.

	Class	*Subclasses*
Classification Order 561, effective Dec. 3, 1976:		
Abolished	303	21.
Established	303	91–119.
Classification Order 562, effective Dec. 6, 1976:		
Abolished	30	3–23.
Established	30	400–450.
Classification Order 563, effective Dec. 6, 1976:		
Abolished	248	216–226.
Established	248	216.1–216.4; 217.1–217.4; 218.1–218.4; 219.1–219.4; 220.1–220.4; 221.1–221.4; 222.1–222.4; 223.1–223.4; 224.1–224.4; 225.1–225.4; 226.1–226.5; 231.1 and 803.1.
Classification Order 564, effective Dec. 6, 1976:		
Abolished	114	.5; 43.5; 66.5 and 235–287.
Established	114	242–292.
Classification Order 565, effective Dec. 15, 1976:		
Abolished	114	206–209.
Established	114	293–311.
Classification Order 566, effective Dec. 16, 1976:		
Abolished	206	72 (incorrectly numbered as "62" in the Manual of Classification). 73–77 and 801.
Established	206	55–3000. Cross Reference Art Collection 824; 825; 828 and 829.
Title change	206	223.
Classification Order 567, effective Dec. 21, 1976:		
Abolished	52	79; 169; 236; 237; 309 and 751–760.
Established	52	79.1–79.9; 79.11–79.14; 169.1–169.9; 169.11–169.14; 236.1–236.9; 309.1–309.9 and 309.11–309.17.
Classification Order 568, effective Jan. 6, 1977:		
Abolished	66	75.
Established	66	75.1 and 75.2.
Classification Order 569, effective Jan. 11, 1977:		
Abolished	156	2–25.
Established	156	625–668. Cross Reference Art Collection 901–905.
Classification Order 570, effective Jan. 18, 1977:		
Abolished	29	200–12.
Established	29	38.9; 56.5; 56.6; 281.1–281.6; 283.5; 564.1–564.8; 566.1–566.4; 650; 700–824.
Title change	29	563.
Classification Order 571, effective Jan. 28, 1977:		
Abolished	139	55.
Established	139	55.1; 455 and 456.

ALFRED C. MARMOR
Administrator for Documentation
February 14, 1977

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,965,678, Sundberg and Cross, POLYOXYETHYLENE ETHERS OF BRANCHED CHAIN ALCOHOLS, **filed** Apr. 30, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1641, *GAF Corporation* v. *Hodag Chemical Corporation.* By stipulation order cause dismissed without prejudice, June 10, 1976.

3,047,196, Levine and Phillips, GARMENT HANGER, **filed** Nov. 10, 1976, D.C., S.D. Fla. (Miami), Doc. (FL) 76–6487–C–SMA, *Huron Machine Products Inc.* v. *A. and E. Warbern Inc., doing business as Warbern Packaging Industries Inc. and Warbern Packaging Industries Inc. of Florida Inc.*

3,068,882, W. Odendahl, VALVE CONSTRUCTION, **filed** Nov. 9, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76–3484, *Yarway Corporation* v. *Klein, Schanzlin and Becker Aktiengesellschaft.*

3,160,440, J. T. Gelardi, CONTINUOUS TWISTER AND FEEDER MECHANISM FOR BRUSH MACHINES OR THE LIKE, **filed** Dec. 4, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75–3502, *American Technical Industries Inc.* v. *Marathon Manufacturing Company.* Patent is valid and the claims thereof are valid. The defendant has taken a license under plaintiff's CT patent and the parties have settled all other causes of action and counterclaims in this litigation. Counterclaims are dismissed with prejudice, Nov. 11, 1976.

3,180,335, Duncan and Baker, DISPOSABLE DIAPER; **Re. 26,151,** same, **filed** Jan. 26, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c237, *Procter & Gamble Company* v. *Weyerhaeuser Company.* Complaint dismissed without prejudice, counterclaim dismissed without prejudice, Feb. 7, 1974.

3,180,557, S. Thulin, BAG WITH HANDLE OF WELDABLE PLASTIC MATERIAL, **filed** Apr. 8, 1976, D.C.N.J. (Newark), Doc. 76–648, *Mobil Oil Corp.* v. *Aktiebolaget Celloplast & Celloplast U.S.A. Inc.* Order terminating action administratively, Nov. 16, 1976.

3,228,413, F. Stevens, KEG TAPPING DEVICE, **filed** Nov. 17, 1976, D.C.N.J. (Newark), Doc. 76–2202, *Hoff-Stevens Inc.* v. *Vending Components Inc.*

3,517,677, A. Smith, INVALID WALKER, **filed** Sept. 21, 1976, D.C. Minn. (St. Paul), Doc. 3–76–352, *Alfred A. Smith* v. *Bird & Cronin Inc.*

3,538,725, Guenther and Barcik, HOOD LOCKING DEVICE, **filed** Oct. 29, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2760, *Chapman Performance Products* v. *Ramm Industries Co. et al.* Cause dismissed for want of prosecution, May 19, 1975.

3,625,758, Stahl, Steffen, Schneble and McCormack, BASE MATERIAL AND METHOD FOR THE MANUFACTURE OF PRINTED CIRCUITS, **filed** Feb. 9, 1976, D.C. Del. (Wilmington), Doc. 76–63, *Kollmorgen Corp.* v. *RCA Corporation.* It is hereby stipulated by and between the parties hereto that this action be dismissed without prejudice, Sept. 24, 1976.

3,625,793, Sheridan and Jackson, BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE, **filed** Oct. 8, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76–3141, *Mallinckrodt Inc.* v. *Air Products, Chemicals Inc. and The Foregger Company Inc.*

3,664,915, W. Gore, SEALING MATERIAL, **filed** May 24, 1972, D.C. Del. (Wilmington), Doc. 4389, *Johnson & Johnson* v. *W. L. Gore & Associates Inc.* Defendant is owner of the patent in suit. Claims 1–9, all the claims of patent issued to defendant are invalid, Sept. 7, 1976.

3,743,280, D. Martinez, EXERCISING DEVICE, **filed** May 5, 1976, D.C. Mass. (Boston), Doc. CA–76–1780–T, *Rainbow Lifegard Products Inc.* v. *L. J. Shulman & Son Inc.* Consent judgment entered that above patent is valid and has been infringed and enjoining defendants from further infringement, July 7, 1976.

3,776,095, M. Atchisson, WEAPON CONVERSION BOLT ASSEMBLY DEVICE, **filed** Sept. 20, 1976, D.C. Conn. (Hartford), Doc. H–76–375, *Bingham, Ltd. and Maxwell G. Atchisson* v. *Okay Industries Inc.*

3,826,222, J. Romick, UNIT-DOSE MEDICATION HANDLING SYSTEM, **filed** Nov. 12, 1976, D.C., N.D. Ohio (Cleveland), Doc. 76–C–1202, *J. M. Romick* v. *Americare Inc.*

3,835,543, Polydoris and Wollar, MEASURING INSTRUMENT, **filed** Sept. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3348, *ENM Company* v. *Transformer Manufacturers Inc. et al.*

3,871,585, Crossman, Kenrick and LeMieux, AIR BED; **3,887,187,** same, AIR CUSHION TABLE GAME; **3,927,885,** same, PUCK AND BAT FOR AN AIR CUSHION TABLE GAME, **filed** Oct. 14, 1976, D.C., S.D.N.Y., Doc. 76–C–4555 (MP), *Brunswick Corporation* v. *Munro Games Inc.*

3,887,187. (See 3,871,585.)

3,890,975, W. McGregor, CONTROLLED RELEASE SUTURE, **filed** May 21, 1976, D.C., S.D.N.Y., Doc. 76–C–2301, *American Cyanamid Co.* v. *Ethicon Inc.*

3,927,885. (See 3,871,585.)

3,992,887, W. Fisher, TRENCH SHORING ASSEMBLY WITH FORCE TRANSFERRING ACCESSORY, **filed** Nov. 23, 1976, D.C., W.D. Mich. (Grand Rapids), Doc. K76–599Ca9, *Griswold Machine & Engineering Inc.* v. *Efficiency Production Inc.*

Re. 26,151. (See 3,180,335.)

Re. 28,685, A. Varga, METHOD AND APPARATUS FOR THE TREATMENT OF COTTON FIBRES, **filed** Mar. 26, 1976, D.C., M.D.N.C. (Greensboro), Doc. C–76–144–D, *Carding Specialists (Canada) Limited* v. *Gunter & Cooke Inc.* **Same, filed** Apr. 1, 1976, D.C., S.D.N.C. (Greenville), Doc. 76–0557, *Carding Specialists (Canada) Limited* v. *John D. Hollingsworth on Wheels Inc.*

D. 239,168, D. Hart, VEHICLE WIND DEFLECTOR, **filed** Sept. 17, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3459, *Donald G. Hart* v. *Leisure Manufacturing Co. Inc.*

Erratum

Under Patent Suits, in the OFFICIAL GAZETTE of Dec. 21, 1976, volume 953, page 881, the paragraph beginning with 3,708,967, and the paragraph beginning with 3,826,068 should be deleted. Also, 3,859,776 (See 3,708,967) should be deleted.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 29, 1977

Re. 28,801	3,961,969	3,985,882	3,998,367
3,786,248	3,962,514	3,986,087	3,998,668
3,804,831	3,964,933	3,986,332	3,998,700
3,830,923	3,965,217	3,986,392	3,998,762
3,836,530	3,965,551	3,987,537	3,998,773
3,838,292	3,967,188	3,988,084	3,998,875
3,847,980	3,967,481	3,988,128	3,998,957
3,855,129	3,968,175	3,988,243	3,999,001
3,868,341	3,968,685	3,988,727	3,999,135
3,869,452	3,968,750	3,988,828	3,999,306
3,871,716	3,969,443	3,989,403	3,999,535
3,873,509	3,970,702	3,989,526	3,999,593
3,875,143	3,970,999	3,989,604	3,999,626
3,880,792	3,971,828	3,990,933	4,000,176
3,881,987	3,972,210	3,990,937	4,000,207
3,886,484	3,973,081	3,991,040	4,000,380
3,912,659	3,973,484	3,991,260	4,000,385
3,914,009	3,973,745	3,991,942	4,001,026
3,921,963	3,974,715	3,991,985	4,001,283
3,925,537	3,975,201	3,992,380	4,001,343
3,929,103	3,975,304	3,992,432	4,001,509
3,940,484	3,977,767	3,992,457	4,001,801
3,941,121	3,977,768	3,992,536	4,001,822
3,943,085	3,977,974	3,992,542	4,001,877
3,943,258	3,978,420	3,992,924	4,001,949
3,946,509	3,978,677	3,993,091	4,002,297
3,947,663	3,979,018	3,993,194	4,002,377
3,948,607	3,979,975	3,993,263	4,002,408
3,949,077	3,980,579	3,994,848	4,002,411
3,950,290	3,980,828	3,995,071	4,002,568
3,950,574	3,981,573	3,995,168	4,002,576
3,950,591	3,982,039	3,995,290	4,002,589
3,951,776	3,982,131	3,996,344	4,002,637
3,951,794	3,982,312	3,996,741	4,002,735
3,952,349	3,982,499	3,996,944	4,002,773
3,955,387	3,982,596	3,997,037	4,002,902
3,955,427	3,982,647	3,997,147	4,003,002
3,955,923	3,982,801	3,997,269	4,003,032
3,956,066	3,983,368	3,997,449	4,003,179
3,956,515	3,383,631	3,997,454	4,003,385
3,956,528	3,983,777	3,997,504	4,003,499
3,958,088	3,983,953	3,997,772	4,003,872
3,958,561	3,984,574	3,997,944	4,003,969
3,958,776	3,985,056	3,998,196	4,004,424
3,959,874	3,985,347	3,998,220	4,004,708
3,960,706	3,985,753	3,998,298	4,004,926
3,960,726			

Disclaimers

Design No. 232,417.—*Stefan Macko*, Milwaukee, Wis. BOTTLE. Patent dated Aug. 20, 1974. Disclaimer filed Feb. 4, 1977, by the assignee, *Miller Brewing Company*.

The term of this patent subsequent to Aug. 13, 1988, has been disclaimed.

3,841,083.—*John M. Bergey*, Lancaster, Pa. SELF-ILLUMINATED LIQUID CRYSTAL TIMEPIECE. Patent dated Oct. 15, 1974. Disclaimer filed Feb. 14, 1977, by the assignee, *Time Computer, Inc.*

The term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

3,915,577.—*Rupert James Cropton*, Sunbury on Thames, England. DISPENSERS. Patent dated Oct. 28, 1975. Disclaimer filed Feb. 11, 1977, by the assignee, *Gavia, A.G.*

Hereby enters this disclaimer to claims 7 and 8 of said patent.

3,990,455.—*Richard L. Panicci*, Hanover, Mass. TEETHER. Patent dated Nov. 9, 1976. Disclaimer filed Jan. 21, 1977, by the assignee, *Kiddie Products, Inc.*

The term of this patent subsequent to Nov. 9, 1990, has been disclaimed.

3,994,240.—*Robin L. Berg*, Hudson, Wis., and *Marvin A. Luger*, Hugo, and *Neil C. Olsen*, Edina, Minn. COIL CAR COVER. Patent dated Nov. 20, 1976. Disclaimer filed Feb. 14, 1977, by the assignee, *Proform, Inc.*

Hereby enters this disclaimer to claim 13 of said patent.

4,001,304.—*Kayson Nyi*, Selleraville, and *Sandra I. Graham*, North Wales, Pa. ACRYLIC ACID ESTERS. Patent dated Jan. 4, 1977. Disclaimer filed Feb. 2, 1977, by the assignee, *Rohm and Haas Company*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,003,416.—*Bernard E. Weidenaar*, Hacienda Heights, Calif.; *Frederick L. Voelz*, Orland Park, and *James J. Simnick*, Riverdale, Ill.; and *Peter P. Moskovich, Jr.*, Gary, Ind. LIQUID DISPENSING NOZZLE ASSEMBLY. Patent dated Jan. 18, 1977. Disclaimer filed Jan. 24, 1977, by the assignee, *Atlantic Richfield Company*.

The term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

4,004,621.—*Bernard E. Weidenaar*, Hacienda Heights, Calif.; *Frederick L. Voelz*, Orland Park, and *James J. Simnick*, Riverdale, Ill.; and *Peter P. Moskovich, Jr.*, Gary, Ind. LIQUID-DISPENSING NOZZLE ASSEMBLY. Patent dated Jan. 25, 1977. Disclaimer filed Jan. 24, 1977, by the assignee, *Atlantic Richfield Company*.

The term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Dedication

2,996,664.—*Fred J. Vogel* and *Edward J. Adolphson*, Wauwatosa, Wis. CORONA DETECTOR. Patent dated Aug. 15, 1961. Dedication filed Jan. 28, 1977, by the assignee, *Allis-Chalmers Corporation*.

Hereby dedicates to the People of the United States, the entire remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 26, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-18-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-1-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-12-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-9-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-7-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-22-76

Expiration of patents: The patents within the range of numbers indicated below expire during March 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,926,352 to 2,931,037, inclusive
Plant Patents..... Numbers 1,919 to 1,925, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,160

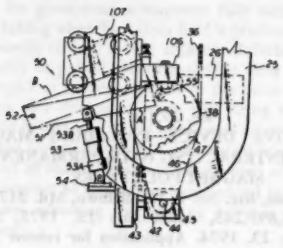
SCREEN PRINTING MACHINE WITH OVAL RAIL FOR INDEXING PALLETS

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines Inc., Hawthorne, N.J.

Original No. 3,795,189, dated Mar. 5, 1974, Ser. No. 292,860, Sept. 28, 1972. Application for reissue Sept. 29, 1975, Ser. No. 617,750

Int. Cl.² B41L *13/16*

U.S. Cl. 101—123 25 Claims



1. A screen printing machine comprising

a suporting frame means,

an oval shaped rail mounted on said frame *means*,

a plurality of pallet means disposed in a common plane circumferentially spaced about said oval rail,

drive means operatively interconnecting said pallet *means* for indexing said [pallets] *pallet means* about said oval rail in said common plane, and

[a] printing head means mounted on said frame means for movement between an operative printing position and an inoperative non-printing position, *said pallet means having substantially coplanar movement as they approach, traverse and depart said printing head means*,

indexing means connected to said drive means for indexing said [pallets] *pallet means* about said oval rail,

said indexing means [including a] *includes* ram stop means,

a ram stop cam follower operatively associated with said drive means, *and*

[and an] activating means for moving said ram stop means into and out of operative position relative to said cam follower to effect the indexing of said [pallets] *pallet means* about said oval rail.

Re. 29,161

DEVICES FOR THE GENERATION OF ULTRASONICS AND THEIR APPLICATION TO THE PREPARATION OF EMULSIONS

Louis Duthion, Paris; Claude Charles Doyotte, Le Plessis Robinson; Claude Jean-Marie Seguela, Argenteuil; Gabriel Barthelemy, Paris; Alain Cinquanta, and Yves Drapeau, both of Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

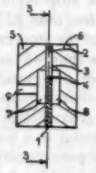
Original No. 3,809,372, dated May 7, 1974, Ser. No. 286,061, Sept. 5, 1972. Application for reissue Oct. 29, 1975, Ser. No. 626,835

Claims priority, application France, Sept. 3, 1971, 71.31975; Dec. 20, 1971, 71.45738; June 27, 1972, 72.23201

Int. Cl.² B01F *3/08*, *5/06*

U.S. Cl. 259—4 R 28 Claims

1. Device for generating [ultrasonics] *waves* in a fluid *in the sonic to ultrasonic range*, comprising a membrane, two side plates located on each side of the membrane and each having at least one recess, said recesses forming adjacent opposing pairs, said membrane having at least a first discontinuity which forms a passage through which the fluid penetrates into the device and at least a second discontinuity extending the first discontinuity and forming a communication between each



pair of said recesses located on each side of the membrane, each such second discontinuity leaving a substantial portion of said membrane extending between each respective pair of recesses sufficient to effectively vibrate, and a conduit from one recess of each pair via which the fluid is evacuated from the device.

Re. 29,162

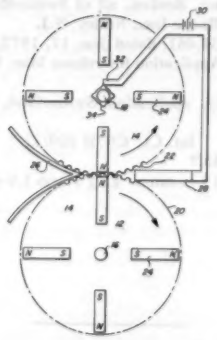
ABUTMENT SWIVEL DOORSTOP

Lyall A. McLennan, 2896 Trinity St., Vancouver 6, British Columbia, Canada

Original No. 3,861,726, dated Jan. 21, 1975, Ser. No. 345,061, Mar. 26, 1973. Application for reissue Oct. 23, 1975, Ser. No. 625,016

Int. Cl.² E05C *5/00*

U.S. Cl. 292—67 14 Claims



1. In abutment stop mechanism for blocking opening movement of a closure *swingable about an upright axis* including a stop member and a mount separate from the closure, mounted adjacent to *the closure in closed position and* [but] independently of the closure [in closed position] and supporting the stop member for turning about a stop member turning axis between a closure-blocking position *of the stop member obstructing* [and a closure-clearing position, in which closure-blocking position the stop member obstructs] a predetermined opening-movement path of a stop-engageable portion of the closure and *a closure-clearing position of the stop member out of the opening-movement path of the closure, in which closure-blocking position of the stop member* a closure-engageable portion of the stop member *located a substantial distance from such stop member turning axis* is engageable by such

stop-engageable portion of the closure to limit *its* movement [of such stop-engageable portion] along such predetermined opening-movement path, [and in which closure-clearing position the stop member is out of the opening-movement path of the stop-engageable portion of the closure, the closure-engageable portion of the stop member being located a substantial distance from the stop member turning axis,] the improvement comprising the mount [being mounted with] *mounting* the stop member *for* turning *about an upright stop member turning* axis substantially perpendicular to and offset slightly from such predetermined opening-movement path of the stop-engageable portion of the closure and located so that a line joining such stop member turning axis and the closure-engageable portion of the stop member in closure-blocking position is at an angle *of less than 45°* to such predetermined opening-movement path of the stop-engageable portion of the closure, *whereby* [of less than 45° so that] pressure of the stop-engageable portion of the closure on the stop member will exert on the stop member a compressive force toward the stop member turning axis greater than the stop member swinging force acting perpendicular to a line joining the stop member turning axis and the stop-engageable portion of the closure when the closure is in its position closest to the stop member turning axis, *and latch means engageable between the mount and the stop member for preventing swinging of the stop member out of closure-blocking position relative to the mount.*

Re. 29,163

1,2,3,4,10,19-HEXANOR-9-OXO-5,9-SECO-25D-SPIROSTAN-5-OIC ACID

Elisabeth Becher, Basel; Hans Els, Lupsingen, and Arno Johannes Schocher, Benken, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Original No. 3,634,461, dated Jan. 11, 1972, Ser. No. 9,949, Feb. 9, 1970. Application for reissue Mar. 9, 1976, Ser. No. 665,204

Claims priority, application Switzerland, Mar. 3, 1969, 3201/69

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.7 **1 Claim**

1. 1,2,3,4,10,19-hexanor-[5]9-oxo-5,9-seco-25D-spirostan-5-oic acid.

Re. 29,164

7-AMINO-CEPHALOSPORANIC AND DECEPHALOSPORANIC ACID DERIVATIVES

Leonard Bruce Crast, Jr., North Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Original No. 3,489,752, dated Jan. 13, 1970, Ser. No. 665,256, Sept. 5, 1967. Application for reissue Dec. 22, 1975, Ser. No. 643,010

Int. Cl.² C07D *417/00*

U.S. Cl. 260—243 C **8 Claims**

14. A compound selected from the group consisting of:

7[D-(−)-α-amino-α-(p-hydroxyphenyl)-acetamido]decephalosporanic acid,

7-[D-(−)-2,2-dimethyl-4-(p-hydroxyphenyl)-5-oxo-1-imidazolidinyl]cephalosporanic acid, and

7-[D-(−)-2,2-dimethyl-4-(p-hydroxyphenyl)-5-oxo-1-imidazolidinyl]decephalosporanic acid, and the non-toxic, pharmaceutically acceptable salts thereof.

Re. 29,165

ELECTROMOTIVE DEVICE INCLUDING MAGNETIC SHIELD INTERACTING WITH PERMANENT MAGNET POLE FACES

George Fred Bode, Rte. No. 1, Middletown, Md. 21769

Original No. 3,895,245, dated July 15, 1975, Ser. No. 472,909, May 23, 1974. Application for reissue Nov. 18, 1975, Ser. No. 633,002

Int. Cl.² H02K *37/00*

U.S. Cl. 310—46 **13 Claims**

6. An electromotive device comprising a magnetic shield, a pair of rotors, each of said rotors having a plurality of spaced, permanent magnet pole faces on its periphery, said rotors being mounted for synchronous rotation of the pole faces of the pair of rotors relative to a point of closest proximity between the peripheries of the two rotors so that while the rotors are in proximity to said point magnetic fields extending from the pole faces of the two rotors interact to produce forces on the rotors causing rotation of the rotors, said shield being mounted relative to the periphery of said rotors and said point to prevent substantial interaction of the magnetic pole faces of the two rotors on one side of said point, whereby the magnetic fields of the two rotors interact assymetrically on the different sides of the point to rotatably drive the rotors in predetermined directions relative to the point, and electromagnet means responsive to the rotation of one of the rotors for supplying a magnetic field to one of the rotors to rotatably drive the rotor between the shield and the point in the same direction it rotates in response to the interaction.

Re. 29,166

MAGNETIC FLAW DETECTOR SYSTEM FOR RECIPROCATING PAIRS OF LEAKAGE FIELD DETECTORS WITH MEANS FOR ADJUSTING THE SPACING BETWEEN EACH PAIR OF DETECTORS

Friedrich M. O. Forster, In Laisen 70, D-7410 Reutlingen 1, Germany

Original No. 3,743,928, dated July 3, 1973, Ser. No. 105,856, Jan. 12, 1971. Application for reissue Mar. 26, 1976, Ser. No. 670,622

Claims priority, application Germany, July 30, 1970, 2037787

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—37 8 Claims

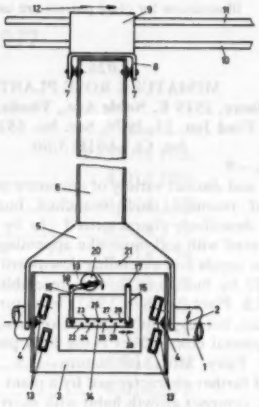
1. Apparatus for detecting defects in the walls of metal tubing, comprising:

means for generating a magnetic field within the body of said tubing whereby a stray field is produced lying radially outwardly of said tubing adjacent defects in said tubing;

a plurality of paired sets of magnetic field sensing devices arranged in spaced relation to the outer surface of said tubing, the devices of each pair being electrically connected in opposition and positioned relative to each other and the test pieces such that a straight line connecting the devices of each pair would be oriented at an acute angle with respect to the tubing longitudinal axis;

means for adjusting the spacing between paired sets of devices;

means for producing relative helicoidal movement between the tubing and the sensing devices; and



means for reciprocating the field sensing devices generally longitudinally of the tubing during relative movement.

PLANT PATENTS

GRANTED MARCH 29, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,026
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 23, 1976, Ser. No. 651,700
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature moss rose plant of hardy dwarf, rounded, much branched, bush type, as illustrated and described, characterized (1) by buds which are heavily covered with soft moss-like appendages—said "moss" covering the sepals and extending downward onto the peduncle, and (2) by buds and flowers resembling the Baby Pinocchio (U.S. Plant Pat. No. 2,967) miniature rose in general form and size, but less double, the color being a light shade of pink; the general color effect being light pink — of a shade resembling Fairy Moss (miniature—U.S. Plant Pat. No. 3,083); and further characterized by a plant which is of moderate vigor, compact growth habit with short internodes, easy to propagate by budding as well as by cuttings; with small semi-glossy to mat foliage; and flowers, produced recurrently throughout the growing season, borne singly or several to the stem in loose clusters.

4,027
ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 23, 1976, Ser. No. 651,952
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers of a color similar to Baccara (a greenhouse florist variety, H.T. rose) and in plant habit and flower size being similar to Pink Mandy, (miniature); the bud and flower color also resembling Fire Princess (miniature) but being of considerably darker shade, the general color effect being a dark red with a fluorescent orange undertone; the small buds having sepals which are noticably longer than average with frilled or serrated edges; and further characterized by a plant which is vigorous and compact, the shoots and branches having very short internodes, said plant being easy to propagate from cuttings, with small glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose clusters.

4,028
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 23, 1976, Ser. No. 651,953
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type as illustrated and described, characterized by buds and flowers resembling the Easter Morning (U.S. Plant Pat. No. 2,177) miniature rose in general form and size but color is rich clear yellow with better than average lasting quality, the general color effect being deep yellow; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings, with medium small semi-glossy foliage and an abundance of bloom, with flowers borne singly or several to stem in loose clusters.

4,029
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Apr. 1, 1976, Ser. No. 672,742
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, as illustrated and described, characterized by buds and flowers which are striped (variegated) in varying proportions of red and white of a color combination resembling Ferdinand Pichard (an older H.P. variety) and a plant habit somewhat taller than broad, the bud and flower form resembling Baby Darling (miniature — U.S. Plant Pat. No. 2,582) and the size similar to New Penny (miniature — not patented); and further characterized by a plant which is vigorous and compact, the shoots and branches having fairly short internodes, said plant being easy to propagate from cuttings (often blooming in small pot when plant is not over 6 inches tall) with small semi-glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose clusters.

4,030
ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Apr. 19, 1976, Ser. No. 677,880
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched bush type, substantially as illustrated and described, characterized by extra long lasting buds and flowers of a color similar to Fire Princess (miniature — U.S. Plant Pat. No. 3,084) and with bud and flower form similar to Eleanor (miniature — U.S. Plant Pat. No. 2,175), the general color effect being a bright shade of red (or orange red) with better than average color stability; the small buds having sepals which tend to remain against the opening buds and flowers; and further characterized by a plant which is vigorous and compact, being easy to propagate from cuttings, with small glossy to semi-glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose sprays or clusters.

4,031
ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Apr. 19, 1976, Ser. No. 677,882
Int. Cl.² A01H 5/00
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a bright pink color resembling the Judy Fischer miniature rose (U.S. Plant Pat. No. 3,137) and resembling the Sheri Anne miniature rose (U.S. Plant Pat. No. 3,826) in size and form of bud and flower; and further characterized by a plant which is vigorous and compact, said plant being easy to propagate from cuttings, with medium small, disease resistant, glossy foliage, an abundance of bloom, with better than average keeping quality, with flowers borne singly or several to the stem in loose clusters.

PATENTS

GRANTED MARCH 29, 1977

ERRATA

For CLASS	See PATENT NO.
297–303	4,014,086
355–050	4,014,112
062–003	4,014,178
062–088	4,014,179
124–081	4,014,307
299–001	4,014,574
299–002	4,014,575
302–031	4,014,576
302–035	4,014,577
302–052	4,014,578
303–003	4,014,579
303–082	4,014,580
305–054	4,014,581
429–057	4,014,712
209–073	4,014,784
252–062.1 L	4,014,856
526–065	4,014,859
358–086	4,015,074
358–158	4,015,075
358–167	4,015,076
358–280	4,015,077
179–006.3 R	4,015,078
358–164	4,015,079
358–104	4,015,080
358–206	4,015,081
219–010.49	4,015,084
219–010.55 E	4,015,085
219–060 A	4,015,086
312–223	4,015,163
361–019	4,015,168
361–045	4,015,169
361–018	4,015,171
361–129	4,015,172
361–388	4,015,173
361–153	4,015,174
361–313	4,015,175
361–232	4,015,176
354–029	4,015,198

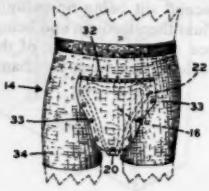
PATENTS

GRANTED MARCH 29, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,014,044
PROTECTIVE DEVICE
David C. Figueroa, 194 15 E. Adams, Reedley, Calif. 93654, and David R. Corneliuz, 3856 E. Farrin, Fresno, Calif. 93726
Filed Jan. 14, 1976, Ser. No. 648,974
Int. Cl.² A41D *13/00*; A41C *1/00*
U.S. Cl. 2—2 **5 Claims**



1. A protective device particularly suited for use in protecting the pelvic organs of a wearer comprising:

A. a garment fabricated from elastomeric material and characterized by a tubular body portion configured to receive the body of a wearer, means for stabilizing the body portion of the garment on the body of a wearer including a pair of tubular leg portions attached to the body portion configured to receive the legs of the wearer in friction-fit engagement, means defining a first pocket in the body portion of the garment arranged to be disposed adjacent to the pelvic region of a wearer when the body of a wearer is received by the body portion of the garment, and means defining a second pocket in said body portion arranged to be disposed adjacent to the lumbar region of a wearer when said first pocket is disposed adjacent to said pelvic region; and

B. a guard including a substantially rigid protective cup disposed in said first pocket adapted to be positioned in protective relation with the pelvic region of the wearer, a plate disposed in said second pocket adapted to be received over the lumbar region of the wearer, and a substantially rigid bar extended between the cup and the plate and connected thereto adapted to be received between the legs of a wearer in spaced protective relation with the pelvic organs of the wearer when the body of the wearer is received by the body portion of the garment.

4,014,045
WORKMAN'S BREAK-AWAY SAFETY APRON
Joseph R. Moyer, 80 Allen Drive, Wayne, N.J. 07470
Filed Jan. 19, 1976, Ser. No. 650,266
Int. Cl.² A41D *13/04*
U.S. Cl. 2—51 **4 Claims**

1. A workman's break-away safety apron comprising in combination:

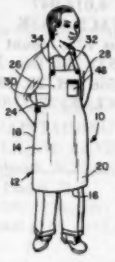
an elongated body including a lower section defined by a lower laterally-extending edge, a pair of longitudinally extending side edges and laterally-extending medial edges extending inwardly from said side edges, and an upper section having a central area constituting a continuation of the lower section and the periphery defined by side edges which extend upwardly from the inner termini of said medial edges and a laterally-extending upper edge connecting the tops of the side edges of said upper section;

a segment of non-metallic pressure fastening material secured to said lower section at each of the junctures of the medial edges and the side edges thereof;

a segment of non-metallic pressure fastening material secured to said upper section at each of the junctures of said upper edge and the side edges thereof;

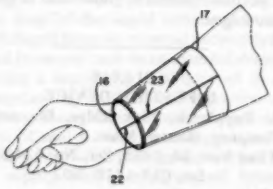
a neck band formed of a strip of flexible material having a segment of non-metallic pressure fastening material secured to each end thereof and detachably connected to the corresponding segments of non-metallic pressure fastening material on the said upper section of the apron body;

and a two-piece waist band including a first strip of flexible



material having a segment of non-metallic pressure fastening material at one end thereof and a plurality of first nonpressure fastening means on the other end thereof and a second strip of flexible material having a segment of non-metallic pressure fastening material at one end thereof and at least one second non-pressure fastening means cooperable with said first fastening means on the other end of said first strip, said first and second strips being detachably connected to the corresponding segments of non-metallic pressure fastening material on the said lower section of the apron body.

4,014,046
DISPOSABLE CUFF PROTECTOR
Evelyn R. Craig, 1159 Harvard Road, Piedmont, Calif. 94610
Filed Oct. 10, 1975, Ser. No. 621,378
Int. Cl.² A41D *27/16*
U.S. Cl. 2—60 **3 Claims**



1. A plurality of disposable cuff protectors comprising:

a. a roll of double layered sheet material;

b. a plurality of sections successively formed in said double layered sheet material, each of said sections being defined by parallel sides constituting the outer edges of said sheets;

c. said sections are divided by first and second narrow transversely running controllably releasable sealing linear areas defining the only areas in sealing contact between each of said layered sheets;

d. said first controllably releasable sealing linear areas are located at spaced intervals along said sheets and extend

transversely across said sheets and form a first angle with the outer edges of said sheet;

e. said second controllably releasable sealing linear areas are located at spaced intervals along said sheets and extend transversely across said sheets between said first sealing linear areas and form a second angle with the outer edges of said sheet thereby forming a conical tube with one end opening greater than the other;

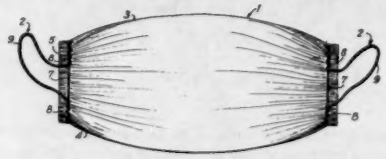
f. a first perforated tear line disposed centrally of said first linear area and extending from outer edge to outer edge of said sheet; and

g. a second perforated tear line disposed centrally of said second linear area and extending from outer edge to outer edge of said sheet.

4,014,047
FACE MASK

James W. Zobel, P.O. Box 125, Mount Kisco, N.Y. 10549

Division of Ser. No. 537,262, Dec. 20, 1974, Pat. No. 3,960,096. This application Oct. 20, 1975, Ser. No. 623,818
Int. Cl.² A62B *23/06*
U.S. Cl. 2—206 **5 Claims**

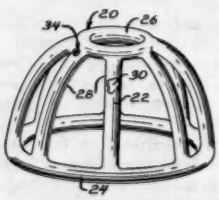


1. A face mask comprising an elongated sheet of porous material having upper and lower longitudinal edges and transverse side edges, a line of stitches of elastic material sewn to said material along both side edges at an inwardly spaced location from said edges, and a length of cord at each side edge secured to said material by the line of stitches thereat without said cord penetrating the porous material and without said stitches penetrating said cord, each length of said cord having opposite spaced ends which are interwoven with said line of stitches to be anchored to said porous material along said side edges, said cord having a free intermediate portion between said ends which forms an ear loop, said elastic material being sewn to said porous material and interwoven with said cord lengths when the porous material is taut such that when the porous material is relaxed, the elastic material exerts a pull on the porous material to gather and contract the material at the side edges.

4,014,048
INFLATION DEVICE

Frederick A. Rappleyea, Park Ridge, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 24, 1975, Ser. No. 634,579
Int. Cl.² A42B *3/02*
U.S. Cl. 2—413 **20 Claims**



1. A cushion device for a protective headgear, comprising:

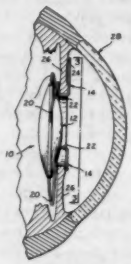
an inflatable liner having a wall at least partially defining a cavity, and an opening extending through said wall;

a fluid lock member secured to said liner wall in the opening, said lock member having an elongated wall section defining a chamber, a flexible outer wall defining an outer portion of the chamber and having a first preformed slit extending between said chamber and the outside of the outer wall, said slit being normally closed to prevent passage of fluid therethrough and being openable a sufficient distance to permit passage of a blunt tip of an inflation needle through said outer wall into the chamber, and said valve member having a flexible inner wall defining an inner portion of the chamber and having a second preformed slit spaced from and generally aligned with the first slit and extending from said chamber to the cavity, with said second slit being normally closed to prevent passage of fluid therethrough and being openable a sufficient distance to permit passage of the blunt tip of the inflation needle or fluid from the chamber to said cavity.

4,014,049
ARTIFICIAL INTRAOCULAR LENS AND SUPPORTING SYSTEM THEREFOR

William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1976, Ser. No. 674,348
Int. Cl.² A61F *1/16, 1/24*
U.S. Cl. 3—13 **10 Claims**



1. A pseudophakos comprising:

a lens having oppositely disposed anterior and posterior optically finished side surfaces;

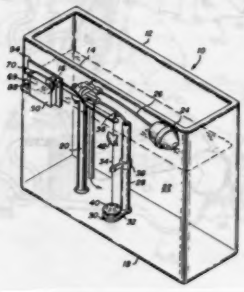
a plurality of slender and resilient supporting arms affixed to said lens adjacent its periphery, said arms each being of a looped configuration including a bight disposed a substantial distance laterally away from said periphery of said lens and a free end positioned adjacent one of said side surface of said lens when said arm is in a relaxed condition;

said free end of said arm being in the configuration of a clip for receiving the irido-pupillary margin of an eye when the pseudophakos is implanted for use and wherewith said lens may be centered relative to the pupil, each free end of each arm when in said relaxed condition being approximately equally radially spaced from said center of said lens an amount approximately corresponding to the radial dimension of said pupil when said pupil is at approximately maximum normal dilation whereby under such condition of pupil dilation said clips do not apply appreciable force against said pupil margin while at maximum pupil contraction only minimal gentle holding force is applied.

4,014,050
APPARATUS EMPLOYING A TIMER FOR CONTROLLING THE QUANTITY OF WATER FLUSHED BY A TOILET

Forrest C. Goldsworthy, 2595 Aragon Court, San Jose, Calif. 95125

Filed Apr. 15, 1976, Ser. No. 677,224
Int. Cl.² E03D *1/34, 5/02;* A61B *19/00*
U.S. Cl. 4—67 A 11 Claims



1. In a toilet including a tank having a water outlet, a valve seatably disposed on the water outlet and a lift rod attached to the valve an improved apparatus for controlling the quantity of water flowing through the outlet comprising:

a timer including a rotatable output shaft, said timer being responsive to the angular rotation of said shaft from an intitial position and operative to return said shaft to said initial position after a time duration corresponding to the amount of angular rotation of said shaft;

a crank coupled to said shaft and being capable of rotating said shaft through a predetermined angle when a force is applied to it;

means mounting said timer to the tank; and

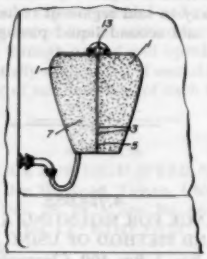
means coupled between said shaft and the lift rod for moving the lift rod a dimension such that the valve is unseated when said shaft is not in said initial position, and said valve is seated when said shaft is in said initial position, whereby when a force applied to said crank rotates said crank and hence said shaft through said predetermined angle said means coupled between said shaft and the lift rod is moved a dimension sufficient to unseat the valve from the water outlet causing water to flow through the water outlet, and whereby the return of said shaft to said initial position causes said means coupled between said shaft and the lift rod to seat the valve on the water outlet after a time duration corresponding to the predetermined angle, said time duration serving to control the quantity of water flowing out of the tank.

4,014,051
BACK SCRATCHING AND/OR SCRUBBING DEVICE

Lewis A. Pettit, 915 S. Second St., Millville, N.J. 08332

Filed Sept. 4, 1975, Ser. No. 610,180
Int. Cl.² A47K *3/22;* A47L *13/12, 13/50;* E04F *21/16*
U.S. Cl. 4—158 4 Claims

1. A device for scratching and scrubbing the human back which is adapted for attachment to a wall surface comprising, in combination, a pair of substantially flat operating elements providing front and rear surfaces; and having adjacent edges of said operating elements being in substantial edgewise alignment, means converting said operating elements for relative pivotal movement about a vertical axis; the remote edges of said operating elements being downwardly tapered when viewed in elevation; a plurality of supporting members connected to the backs of said operating elements and extending rearwardly with respect thereto; a rearwardly-facing suction cup connected to the outer end of each of said supporting members; and means carried on the front surface of each of

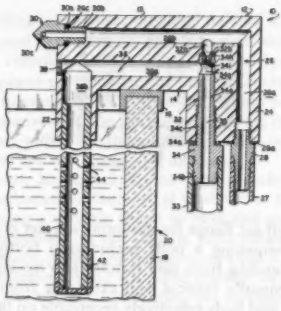


said operating elements for contacting the skin on the back of the user of the device.

4,014,052
APPARATUS FOR MAINTAINING A PREDETERMINED LIQUID LEVEL

Keith H. Wolos, Pequannock, N.J., assignor to Meridian Industries, Inc., Pompton Plains, N.J.

Filed Feb. 26, 1976, Ser. No. 661,799
Int. Cl.² E04H *3/16, 3/18;* F16L *22/02*
U.S. Cl. 4—172 16 Claims



1. An apparatus adapted to be mounted on a liquid-containing tank having at least one upstanding wall and constructed to control the level of the liquid contained in said tank by providing fresh liquid from an external pressurized source and expelling liquid from said tank to an external drain comprising a housing having a supporting wall adapted to rest on and straddle said upstanding wall with a first portion of said housing extending over the surface of the liquid in said tank and a second portion of said housing extending outwardly of said upstanding wall, a first liquid passageway formed in said housing having a supply inlet in said second housing portion adapted to be coupled to a source of pressurized liquid and a supply outlet in said first housing portion adapted to emit liquid into said tank from a position above the level of the liquid in said tank, a second liquid passageway formed in said housing having a drain inlet connected to said first liquid passageway and a drain outlet in said second housing portion arranged to be coupled to said drain, means in said second liquid passageway for restricting the flow of liquid from said first passageway to said second passageway, and a third liquid passageway in said housing having a liquid inlet in said first housing portion adapted to be coupled to the liquid in said tank and a liquid outlet coupled to the second liquid passageway, so that as liquid from said pressurized source flows from said supply inlet toward said supply outlet of said first passageway a portion of said liquid is diverted to flow through said

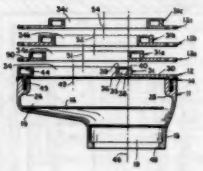
restricting means and said second passageway, creating a region of reduced pressure in said second passageway whereby liquid from said tank is drawn through said third liquid passageway to said region of reduced pressure and is expelled from said second liquid passageway through said drain outlet.

4,014,053

OFF-SET FLANGE FOR MOUNTING A WATER CLOSET, AND METHOD OF USING SAME

Basil B. Jones, Rte. 2, Box 400, Clearwater, Fla. 33515

Filed June 12, 1975, Ser. No. 586,161
Int. Cl.² E03D *11/00*
U.S. Cl. 4—252 R **5 Claims**



1. An off-set flange for mounting a water closet, said off-set flange comprising a body including a bottom, a discharge spout extending from said bottom and having a first centerline, a generally vertical wall extending from said bottom, a cover for said body selectively receivable on the upper edge of said wall, said cover defining an opening therethrough for placing material into said body, said opening having a second centerline, said second centerline being spaced from said first centerline.

4,014,054

SHAMPOO DEVICE

Edward J. Pasquarello, 5 Silvermine Road, Woburn, Mass. 01801

Filed May 7, 1976, Ser. No. 684,159
Int. Cl.² A47K *3/12*; **A61H** *35/00*
U.S. Cl. 4—159 **9 Claims**

1. A shampoo device, comprising a tray shaped liquid receiving surface for conveying liquid away from the head, a pair of opposing laterally disposed ridges on said tray for preventing water overflow, at least one of said ridges defining an internally disposed channel open at both ends and adapted to convey a flow of water, first and second hose engaging part means disposed on each open end of said channel, a first length of hose communicating with said first part and a supply of water, a second length of hose communicating with said second part and adapted to supply water to the head, an arcuate shaped collar adapted to engage the neck, closure means adapted to securely engage said collar about the neck

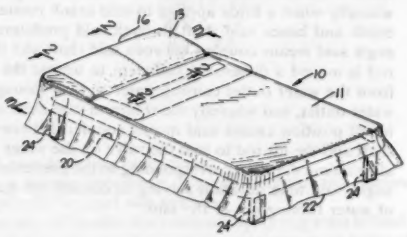
and a flexible apron of water impermeable material depending from said collar and adapted to engage the shoulders.

4,014,055

SHEET-SPREAD WITH INTEGRAL PILLOW RETAINING SLEEVE

Susan Torres, c/o Mrs. G. Mendez, P.O. Box 40, Jackson, N.J. 08527

Filed Jan. 27, 1975, Ser. No. 544,636
Int. Cl.² A47G *9/00*
U.S. Cl. 5—334 C **1 Claim**



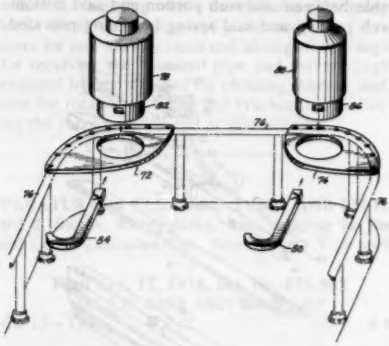
1. A sheet-spread device comprising a generally rectangular body portion of cloth, said body portion including edges which correspond to the top, bottom and sides of a bed adapted to receive said sheet-spread, said generally rectangular portion having a width and length corresponding to said associated bed, a pillow receiving tubular sleeve having the axis thereof disposed transversely to the length of the generally rectangular portion, said sleeve being joined to said rectangular portion along a longitudinal line on the circumference thereof disposed generally parallel to the axis thereof, said line being spaced from the top of the generally rectangular section a distance such that when the sleeve has a pillow disposed therein the extremity of the sleeve registers with the top of the generally rectangular section, said sheet-spread further comprises a depending retaining section having a peripherally disposed elastic member for tight fitting engagement with the bed; and a depending flounce over said retaining section.

4,014,056

TANK MOUNTING MEANS

Richard A. Wainwright, 10504 Wheatly St., Kensington, Md. 20795

Filed Jan. 26, 1976, Ser. No. 652,087
Int. Cl.² B63B 17/00
U.S. Cl. 9—1.7 16 Claims



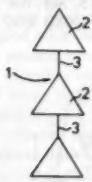
1. A marine tank mount for a water surface traversing vessel comprising a rack, said rack being attached to a deck member of the vessel, the deck member being disposed above the water surface, said rack being above the vessel deck and at least partially horizontal, the horizontal portion of said rack being provided with at least one opening, at least one tank, said tank being provided with a bottom flange, said tank beng mounted on said rack whereby said flange extends downwardly through said opening, the portion of said flange below said rack being provided with at least two holes, and a locking bar, said bar extending through said holes, whereby said tank is attached to said vessel above the deck of the vessel.

4,014,057

CHAIN-LIKE RESCUE DEVICES PARTICULARLY FOR SMALL BOATS

Kalervo Kuojärvi, Mikonkatu 25 B 29, 00100 Helsinki 10, Finland

Filed June 13, 1975, Ser. No. 586,629
Claims priority, application Finland, June 17, 1974, 741847
Int. Cl.² B63C 9/26, 9/22
U.S. Cl. 9—14 8 Claims



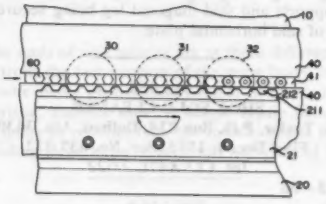
1. In a rescue device for a vessel such as a small boat, a plurality of bodies each formed with an aperture large enough to facilitate manual grasping of the bodies by an individual to be rescued or to receive a foot of the individual to be rescued, and connecting means connecting said bodies in a given sequential arrangement one to the next and forming with said bodies a chain-like structure by means of which an individual can with his hands and feet climb upwardly along the structure back to the vessel, each body having opposed upper and lower end regions when the chain-like structure hangs freely, and each of said end regions of each body being formed with openings passing therethrough, respectively, and said connecting means including a plurality of units each including a rod of substantially U-shaped configuration having a pair of opposed legs terminating in a pair of free end regions, respectively, and a substantially straight rod extending across said legs at said free end regions thereof and connected thereto, and the U-shaped rod of one of said units of said connecting means extending through one of said openings of each body while the substantially straight rod of one of said units extends through the other of said openings of each body.

4,014,058

FEEDING DEVICE FOR HIGH SPEED NUT FORMERS

Yuan Ho Lee, 85 Jen Ho Road, Tainan, China /Taiwan

Filed Dec. 29, 1975, Ser. No. 644,942
Int. Cl.² B21D 53/24
U.S. Cl. 10—76 T 4 Claims



1. A feeding device for a high speed nut forming machine having a machine body on which at least two dies are mounted comprising:

a manipulating mechanism provided on said machine body and adapted to provide advancing motion along a straight line and returning motion along an arched path;

two guide plates provided on said machine body and spaced parallel to one another to define a feeding path between two successive dies, the feeding path having its center axis congruous with a line drawn through and connecting the centers of the two successive dies; and

a feeding plate having an edge having a plurality of equally spaced indentations thereon, at least two of said indentations having a suitable shape to hold and convey workpieces positioned in the feeding path between the two parallel guide plates, the distance between a least two of said indentations being a suitable fraction of the distance between the two successive dies, the feeding plate being provided on the manipulating mechanism and adapted to have the edge thereof having the plurality of indentations thereon moveably and removeably positioned in the feeding path;

thereby to successively hold, convey, and release workpieces in said feeding path due to the alternating advancing straight line and returning arched path motions provided by the manipulating mechanism so that workpieces are moved along said feeding path in a plurality of discrete steps from one die to the next successive die.

4,014,059

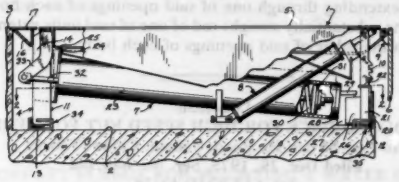
FRAME CONSTRUCTION FOR A DOCKBOARD

Thomas G. Artzberger, Menomonee Falls, and Thomas J. Wiener, Brown Deer, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed July 28, 1975, Ser. No. 599,891
Int. Cl.² E01D 1/00
U.S. Cl. 14—71.3 8 Claims

1. In a dockboard construction, a frame including a rear frame section and a front frame section, a ramp hinged to the rear frame section and movable between a generally horizontal cross traffic position and an upwardly inclined position, said rear frame section including a base member and a plurality of vertical supports extending upwardly from said base member, said ramp being hinged to said vertical supports, said rear frame section also including a horizontal plate connected

to the upper end portions of said vertical supports and extending rearwardly of said supports, said horizontal plate adapted to be mounted substantially flush with the upper surface of the dock, said rear frame section also including a generally V-



shaped support having a vertical leg and a diagonal leg, said vertical leg being attached to the upper end portions of said vertical supports and said diagonal leg being secured to the underside of said horizontal plate.

4,014,060

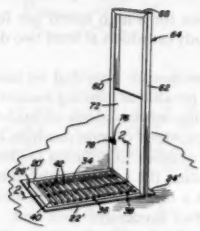
SHOE SOLE CLEANER

Wallace N. Taylor, P.O. Box 824, Dothan, Ala. 36301

Filed Dec. 4, 1975, Ser. No. 637,722

Int. Cl.² A47L *23/22*

U.S. Cl. 15—36 **7 Claims**



7. In combination, a shoe sole cleaner including a support grill, motorized brush means supported beneath said grill including bristles projecting upwardly through said grill, a position retainer supported adjacent one marginal edge portion of said grill, a cover panel having one marginal edge pivotally supported adjacent said one marginal edge portion for swinging of said cover panel between a first horizontal position closely overlying said grill and a second upstanding position at least closely adjacent said position retainer, said cover panel and said position retainer including coacting latch means releasably retaining said cover panel in said second position.

4,014,061

VEHICLE WIPER BLADE CONSTRUCTION

Willi Jurowski; Alfred Kohler; Hans Prohaska, all of Bietigheim, and Eugen Schrade, Ludwigsburg, all of Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Germany

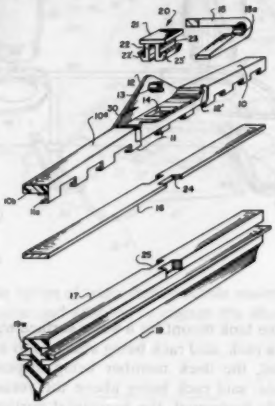
Filed Aug. 22, 1975, Ser. No. 606,979

Claims priority, application Germany, Aug. 22, 1974, 2440179

Int. Cl.² B60S *1/04*

U.S. Cl. 15—250.42 **3 Claims**

1. A wiper blade for wiper arm installations in vehicles, comprising a blade yoke having top and bottom surfaces and a side wall on each side of said top surface, said side walls including lower portions extending downwardly from said bottom surface and with inturned flange portions adjacent the bottom ends thereof defining wiper blade supports which extend inwardly from respective opposite sides and terminate in opposite inner edges which are spaced apart, a wiper blade having an outer blade portion and an inner flat web portion and an intermediate portion of smaller width than said web portion interconnecting said web portion and said blade portion, said web intermediate portion being positionable between opposite blade supports and said blade being insertable with said intermediate portion located between said supports from an end of said yoke so as to position said web portion between said supports and said yoke bottom, a spring bar engageable between said web portion and said bottom, said blade web portion and said spring bar being provided with



laterally aligned notches extending inwardly from respective opposite sides, said yoke having an opening therethrough overlying said notches and the portions of said spring bar and said web portion between the notches, and a U-shaped locking member having laterally spaced longitudinally extending first and second leg portions engageable in the respective notches and a central connecting portion interconnecting said legs disposed over said yoke, each locking leg portion having outwardly extending parts engageable below a respective one of said yoke side walls, said leg portions locking said blade and said spring bar against longitudinal movement.

4,014,062

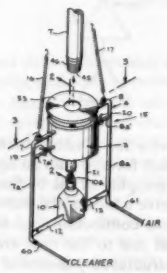
THREAD CLEANER WITH ROTATABLE AND ADJUSTABLY SUPPORTED BRUSHES

Thomas W. Scott, 116 Maplewood Drive, Lafayette, La. 70501, and Walter J. Roy, 122 W. Henry, Rayne, La. 70578

Filed Jan. 6, 1975, Ser. No. 538,867

Int. Cl.² B08B *9/02*

U.S. Cl. 15—104.04 **4 Claims**



1. A cleaner for cleaning the threads on a pipe end comprising:

a housing having an open end;

a frame extending from each side of said housing;

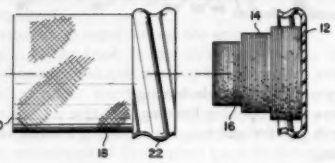
resilient means connected to said frame for resiliently and movably supporting said housing in an elevated position;
a disc rotatably supported in said housing opposite said open end of said housing;
brush means for engaging the threaded pipe end;
adjustable means supporting said brush means on said disc for lateral adjustment thereof;
a member projecting from said disk adjacent said brush means for engaging within the end of a pipe to support it while the threaded pipe end is cleaned;
a cover for said housing open end having an opening therein for receiving the threaded pipe end therethrough to be engaged by said brushes for cleaning thereof; and
means for rotating said disc and brushes thereon for cleaning the threaded pipe end in said housing.

4,014,063

APPARATUS FOR CLEANING TUBES AND FITTINGS

Edward J. Bunke, Montgomery, Ala., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 12, 1976, Ser. No. 675,952
Int. Cl.² A46B *5/02*; **B08B** *9/02*
U.S. Cl. 15—111 **4 Claims**



1. Apparatus for cleaning tubing and fittings having hollow circular cross sections differing in diameter, said apparatus comprising:
a hollow cylinder open at one end and closed at the other;
a first ring shaped cleaning brush having an outer diameter essentially equal to the inner diameter of the cylinder and disposed concentrically within the cylinder abutting the closed end and having a first inner diameter said first brush having four equidistantly disposed radial slots therein dividing the first brush into four quadrants;
a second ring shaped cleaning brush having a like outer diameter and a second inner diameter larger than the first inner diameter, said second brush being disposed concentrically within the cylinder abutting the first brush, said second brush having four equidistantly disposed radial slots therein aligned with the four slots in the first brush and dividing the second brush into four quadrants; and
a third ring shaped cleaning brush having a like outer diameter and a third inner diameter larger than the second inner diameter, said third brush being disposed concentrically within the cylinder abutting the second brush and the open end of the cylinder, said third brush having four equidistantly disposed radial slots therein aligned with the four slots in the second brush and dividing the third brush into four quadrants.

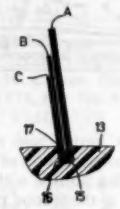
4,014,064

HAIRBRUSH

Kenichi Okazaki, 3-2-, 2-chome, Higashi-honmachi, Yaoshi, Osaka, Japan

Continuation-in-part of Ser. No. 486,410, July 8, 1974, abandoned. This application May 9, 1975, Ser. No. 576,048
Int. Cl.² A46B *3/16*
U.S. Cl. 15—159 A **1 Claim**

1. A hairbrush comprising a main body having a face portion, a plurality of tufts of bristles, each of said tufts comprising synthetic resin bristles of two lengths, the longer length being greater in number than the shorter length, each of said resin bristles being bent at a point other than the mid-point of the bristle, to form a long portion and a short portion, wherein the long portions of each bristle are equal, said bristles being affixed to said face portion at the bend portion of the bristle,



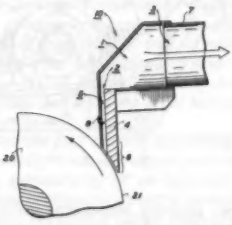
so that the ends of said bristles are at three different heights, or steps, from the face portion of the main body, the middle height bristle being proportionely lesser in number than the highest bristle, and the shortest height bristle being proportionately lesser in number than the middle height bristle, the corresponding three steps of each tuft being equal in height.

4,014,065

MAGNETIC DEVELOPER REMOVAL SYSTEM

Frederick W. Hudson, W. Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1975, Ser. No. 608,362
Int. Cl.² A47L *9/02*
U.S. Cl. 15—306 R **6 Claims**



1. In a magnetic imaging system wherein a member having a latent magnetic image is developed with magnetic developer material, the improvement comprising: developer material removal means comprising a chamber having an entrance and exit ports; the cross-sectional area ratio of entrance port to exit port being sufficiently small to assure substantially uniform air-flow across the entrance port when the chamber is subjected to negative pressure through the exit port; the entrance port of the chamber being in communication with means for subjecting the developed surface of the member to a substantially uniform shearing air flow when the chamber is subjected to the negative pressure.

4,014,066

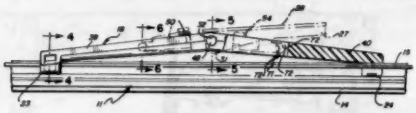
LOCKING LEVER FOR PLASTIC LINK

William H. Harbison, Valparaiso, and John J. Plisky, Munster, both of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 31, 1976, Ser. No. 672,252
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 **10 Claims**

8. In a wiper assembly having a wiper blade, a pressure-distributing superstructure operatively connected with the wiper blade, and means for pivotally connecting at least two parts of the superstructure together, a portion of one of the parts

having a vertical open space between a pair of spaced apart walls permitting deflection of the walls of the said part inwardly into the vertical open space during assembly and disassembly of two of the parts of the superstructure, in combination with a lock having a mounting portion and a locking



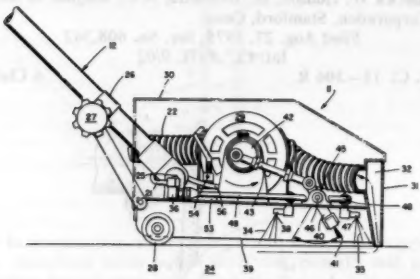
portion, said lock having said mounting portion pivotally positioned in a remote portion of said vertical open space to position said locking portion within the vertical open space between the walls of the second part to prevent deflection of the walls of the second part inwardly into the vertical open space.

4,014,067

CARPET CLEANING IMPLEMENT

Charles Ross Bates, 1111 Morse Ave., No. 179, Sunnyvale, Calif. 94086

Filed June 20, 1975, Ser. No. 588,729
Int. Cl.² A47L *7/00*
U.S. Cl. 15—320 **10 Claims**



1. A carpet cleaning implement useful for continuously washing and rinsing a floor fastened carpet in a single operation, comprising:

a head having a cover thereover, said head being adapted to be rolled along on said carpet upon roller means located adjacent a first end thereof, a bottom portion of said head facing said carpet, said head including adjacent to said bottom portion thereof first liquid delivery means for delivering a flow of a first liquid under pressure onto said carpet, a brush adjacent said first liquid delivery means for agitating said first liquid into said carpet, second liquid delivery means adjacent said brush and on an opposite side therefrom from said first liquid delivery means for delivering a flow of a second liquid under pressure into said carpet and a channel adjacent a second end of said head communicating with a vacuum source of at least about 100 inches of water, said channel being adjacent said second liquid delivery means and on an opposite side therefrom from said brush, said channel serving for picking up said first liquid and said second liquid as said head is rolled along said carpet in a direction whereby said first liquid delivery means first passes a portion of said carpet followed sequentially by said brush, said second delivery means and said channel;

motor means drivingly communicating with said brush to supply oscillatory forwards and backwards motion thereto alternately towards and away from said first and second ends of said head respectively;

a handle extending from said first end of said head for operator control thereof, said motor means, head, first and second liquid delivery means, channel and handle being located so that said roller means supports the great majority of the weight of said implement, said head being normally rolled along said carpet by exertion of a pulling force on said handle;

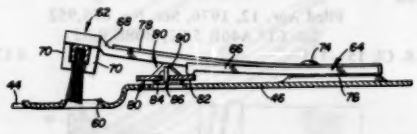
valve means on said handle communicating with a liquid source for controlling flow of said first liquid through said first liquid delivering means and of said second liquid through said second liquid delivering means.

4,014,068

BRUSH MOUNTING AND TORSION SPRING SUPPORT FOR POWERED NOZZLE

Rex E. Payne, and Henry F. Aegerter, Jr., both of Massillon, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Apr. 3, 1975, Ser. No. 564,808
Int. Cl.² A47L *9/06*
U.S. Cl. 15—355 **12 Claims**



10. A rug and floor nozzle having;

a. a downwardly opening housing,

b. a bottom pan for said housing including a brush receiving aperture,

c. a reciprocating flat bar lying against said bottom pan and movably attached to said bottom pan,

d. tear shaped cams formed on said reciprocating flat bar,

e. brush means mounted on said bottom pan and extending through said aperture and including means for mounting said brush means resiliently on said bottom pan, and

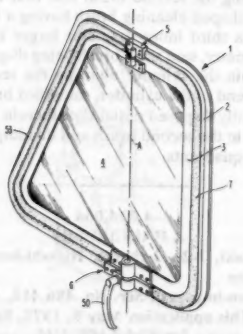
f. said tear shaped cams being movably interposed between said mounting means and said bottom pan to thereby control the distance said brush means extends out of said aperture.

4,014,069

PIVOTS FOR VENT WINDOW ASSEMBLIES

Gary S. Walker, Norristown, Pa., assignor to Young Windows Inc., Conshohocken, Pa.

Filed June 9, 1976, Ser. No. 694,133
Int. Cl.² E05D *11/08*
U.S. Cl. 16—140 **5 Claims**



1. Pivot mechanism for vehicle vent window assembly comprising:

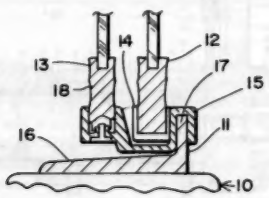
a first housing and a second housing, the housings being disposed one above the other;
a pivot stud fixed to the first housing;
a gripping cavity extending thru the second housing and receiving said stud, the axis of the pivot stud and the axis of the gripping cavity being co-axial;
a gripping slot extending thru said second housing in the same direction as said gripping cavity and also extending from the periphery of the second housing to said gripping cavity and the slot forming a moveable, resilient gripping arm on the second housing;
a clearance aperture formed in said gripping arm;
a locking slot extending thru said second housing in the same direction as said gripping slot;
a clearance aperture formed in the second housing in alignment with first said clearance aperture and extending between and open to said gripping slot and to said locking slot;
a gripping stud disposed in said clearance apertures and having a threaded end extending into said locking slot, the clearance apertures mounting the stud for rotation and for axial movement;
a shoulder on said gripping stud inwardly of said square end and bearing on said gripping arm;
a nut on the threaded end of the gripping stud and engaging the walls of the locking slot whereby rotation of the nut is restrained;
a control knob mounted on the gripping stud;
rotation of the knob in one direction causing the gripping stud to rotate in said nut and thereby move axially so that said shoulder exerts pressure on the gripping arm and moves the arm in a direction to collapse said gripping cavity and thereby exert a gripping force on the pivot stud and movement of the control knob in the opposite direction causing the gripping stud to rotate in said nut and thereby move axially in the opposite direction so that said shoulder relieves pressure on the gripping arm whereby the resiliency of the arm moves the same in the opposite direction to expand the cavity to relieve the gripping force on the pivot stud.

4,014,070

PANEL ATTACHED GUIDES FOR TUB ENCLOSURES AND THE LIKE

Morton S. Rifkin, Hialeah, Fla., assignor to Diston Industries, Inc., Hialeah, Fla.

Filed Aug. 25, 1975, Ser. No. 607,475
Int. Cl.² E05D *13/02*
U.S. Cl. 16—90 **4 Claims**



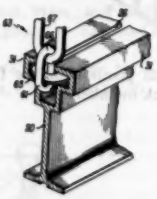
1. A panel guide member for tub and shower enclosures and the like comprising a first web portion, a first leg portion extending from one edge of said first web portion, leg means extending from the other edge of said first web portion in substantially spaced relation to form a slot for receiving a panel, a second web portion extending from said leg means in substantially parallel relation with said first web portion, a second leg portion extending from said second web portion in a substantially parallel and opposite direction of said first leg portion and forming a slot with said leg means for receiving a track, a substantially pliable tab member extending from said first web portion, a pin mounted on the free end of said tab member and an opening in said first web portion for receiving said pin whereby said panel guide member is secured to said panel received in said first named slot.

4,014,071

CURTAIN SUSPENSION ASSEMBLY

Richard W. Janson, Box 8110, Canton, Ohio 44711

Filed Sept. 29, 1975, Ser. No. 617,508
Int. Cl.² E05D *13/02*
U.S. Cl. 16—93 R **4 Claims**



1. A traverse rod for supporting curtains and the like in combination with supporting structure which includes a depending vertical part and a horizontal part connected thereto and spaced above the bottom of said vertical part, said rod comprising:
an upper rod support portion which comprises two spaced apart arms which define between them a groove, said groove having a vertical cross-section configuration substantially of an upright T, the upper ends of said arms defining a slot giving access centrally into said groove for receipt therein of said vertical part of said supporting structure for the rod, the bottom of said vertical part received in the vertical portion of said T-shaped groove, and said horizontal part received in the horizontal portion of said T-shaped groove; and
a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said lower portion being substantially of an inverted T shape in cross-section and comprising a central vertically disposed part and a lower horizontal flange centrally joining the lower aspect of said vertically disposed part, the upper surfaces of said flange on both sides of said vertically disposed part adapted to receive curtain or the like carriers for horizontal movement therealong, the upper aspect of said vertically disposed part joining with said arms and being substantially centered under said slot whereby a vertical plane containing said vertically disposed part passes through said slot.

4,014,072

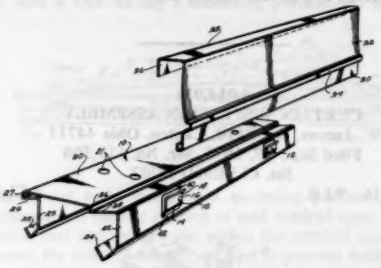
FASCIA AND TRACK FOR A SLIDING DOOR

William J. Schumacher, Downey, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed Oct. 30, 1975, Ser. No. 627,046
Int. Cl.² A47H *1/04*
U.S. Cl. 16—95 R **4 Claims**

1. A track assembly for supporting doors from an overhead horizontal surface, comprising: a longitudinal track member having a normally vertical surface along at least one side of the track, clip means spaced longitudinally on said surface, the clip means including upwardly projecting fingers integral with the side of the track forming slots between the fingers and said surface; and a fascia member having an elongated outer surface and an inverted lip along one margin, the lip extending downwardly and engaging said slots, the fingers of the clip

means clamping the inverted lip against the vertical surface of the track member to frictionally secure the fascia in position



so that the vertical position of the fascia can be adjusted relative to the track member.

4,014,073

ADJUSTABLE ROLLER CONSTRUCTION FOR WINDOWS, DOORS OR THE LIKE

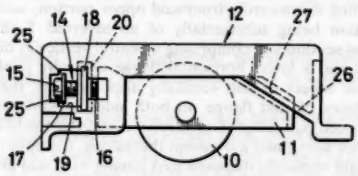
Takeo Uehara, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 11, 1974, Ser. No. 522,533

Claims priority, application Japan, Nov. 27, 1973, 48-137566[U]

Int. Cl.² E05D *15/06*

U.S. Cl. 16—105 **3 Claims**



1. In a roller device of the type including a roller, a roller holder rotatably supporting said roller, and a mounting frame supporting said roller holder in such a manner that said roller holder is adjustably displaceable outwardly relative to said mounting frame when applied with a pressure in a predetermined direction, the combination comprising an inclined surface on said roller holder disposed for sliding engagement with an inclined surface on said mounting frame to guide said roller holder for movement outwardly relative to the mounting frame upon application to said roller holder of a pressure in said predetermined direction, an adjusting screw adapted to apply pressure to said roller holder in said predetermined direction to cause the outward displacement of said roller holder relative to said mounting frame, said adjusting screw having a flange fixedly mounted thereon just below its head, and stop means on said mounting frame positioned to limit the movement of said adjusting screw in its loosening direction by engaging said flange thereon, said roller being supported by said roller holder for rotation relative thereto about an axis fixed with respect to the roller holder and adjustable relative to said mounting frame in accordance with the position of said adjusting screw.

4,014,074

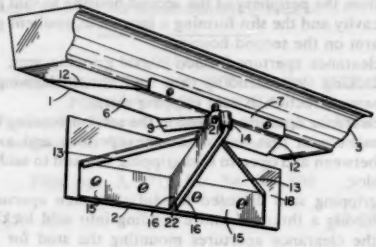
ADJUSTABLE HINGED BRACKET FOR A DRAIN TROUGH

Lloyd Henry Faye, 8821 Elm Road, Richmond, Va. 23235

Filed Feb. 25, 1976, Ser. No. 661,322

Int. Cl.² E05D *5/06*

U.S. Cl. 16—135 **6 Claims**



1. A hinge comprising a harness member comprising a seating portion, a flexible back portion, a front retaining lip extending substantially vertically above said seating portion, a rear retaining lip extending at a downward angle from the top of said back portion, and an aligning blade affixed to the underside of said seating portion and vertically positioned with respect to said seating portion and said back portion, and a support bracket member comprising a shelf extending horizontally forward, a mounting shoulder disposed perpendicularly to said shelf, and an open-bottomed slot located beneath said shelf and adapted to receive the aligning blade of said harness member, said harness member being pivotably joined to said support bracket member.

4,014,075

LIBERATING MEAT FROM SLAUGHTERED ANIMALS, AND A PRESS FOR SEPARATING MEAT FROM BONES

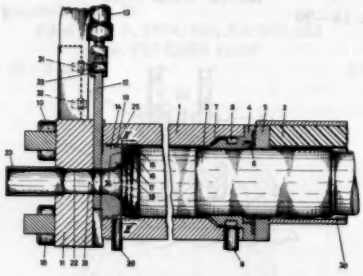
Theodorus M. van Bergen, Oss, Netherlands, assignor to Protecon B.V., Netherlands

Filed Jan. 17, 1975, Ser. No. 541,849

Claims priority, application Netherlands, Apr. 24, 1974, 7405531; Aug. 30, 1974, 7411576

Int. Cl.² A22C *17/04*

U.S. Cl. 17—1 G **5 Claims**



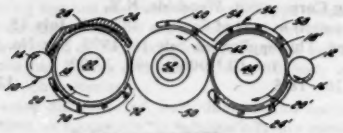
1. A press for separating flesh from bones which comprises a chamber for receiving a charge of bones with flesh attached; a plunger moveable axially in said chamber to compress the bones and flesh therein and thereby liberate from the bones flesh in the form of a paste; means in said chamber defining restricted size passages allowing the exit from the chamber of said flesh paste and retaining in the chamber the bones; cover means connected to said chamber to define a passage for the discharge of compressed bones from the chamber; and valve means associated with said cover means and operable to selec-

tively open and close said passage to allow discharge of the bones therefrom when open, and to seal the passage and thereby retain the bones in the chamber when closed.

4,014,076
HOUSING WITH GROOVE

Josef Milan Slanik, Kirkland, Canada, assignor to The Bobtex Corporation Limited, Quebec, Canada

Filed Oct. 30, 1975, Ser. No. 627,365
Int. Cl.² D01G 9/16
U.S. Cl. 19—96 **8 Claims**

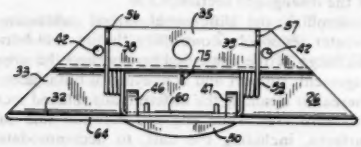


1. In a fiber drafting assembly comprising a rotatable opening roll, means for feeding fibrous material to said opening roll, the improvement comprising a housing member extending about at least a portion of the circumference of said opening roll, said housing member having a groove located interiorly thereof adapted to receive fibers doffed from said opening roll, said groove being open throughout its length to the circumferential surface of said opening roll having an initial relatively shallow and relatively wide portion tapering to a relatively deep and relatively narrow discharge portion in the direction of fiber advancement, said groove increasing in cross-sectional area in the direction of fiber advancement.

4,014,077
CLIP

Morley Hitchcock, 8846 King Memorial Road, Mentor, Ohio 44060, and Maurice A. Lambrix, 6943 Post Lane, Hudson, Ohio 44236

Filed Oct. 15, 1975, Ser. No. 622,692
Int. Cl.² B42F 1/00
U.S. Cl. 24—67.5 **7 Claims**

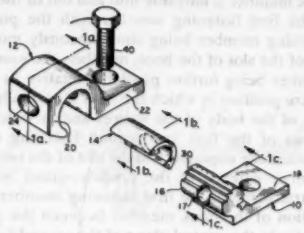


1. The combination of a clipboard having a mounting surface and a plastic clip secured to the mounting surface, said clip including a one-piece unitary member having first and second sides and a connecting portion defining a generally U-shaped cross sectional configuration, a mounting wall extending laterally outwardly from said first side and having first and second spaced spring retaining grooves extending transversely thereacross, wall means defining spaced openings through said mounting wall with securing members extending therethrough to secure said clip to said mounting surface, first and second spaced spring retaining lugs formed on said second side of said unitary member, a lifting member on the outside of said second side of said unitary member to enable a user of the combination to lift said clip, a torsion spring residing within said U-shape of said unitary member and having first and second free ends and an interconnecting portion, said first and second free ends respectively residing is said first and second spring retaining grooves and held therein by the mounting surface of said clipboard, said interconnecting portion of said spring being secured by said first and second spring retaining lugs, said second side of said unitary member having an engaging surface to hold paper on said mounting surface of said clipboard, said unitary member between said mounting wall and said first side being thinner than at other places so as to permit flexing of the unitary member at this position during operation of the clip, said engaging surface of said unitary member in its molded condition being a greater distance from said connecting portion than said mounting wall whereby when said clip is secured to said clipboard and said engaging surface and said mounting wall both lie on the same surface a force is created tending to hold said engaging surface against said mounting surface.

4,014,078
CLAMPING DEVICE WITH ADJUSTING RING

Paul V. Cornell, Amherst, Mass., and Paul A. Cornell, Knockanore, Ireland, assignors to Electro-Clamp Corporation, Beverly Hills, Calif.

Filed Jan. 16, 1976, Ser. No. 649,653
Int. Cl.² F16G 11/00
U.S. Cl. 24—132 R **7 Claims**



1. A cable clamping device of the rotary jaw type comprising:

a male member including a generally cylindrical head and a mounting tail extending therefrom, said male head having a transverse cable-receiving bore;

a female member including a sleeve and a mounting tail extending therefrom, said sleeve having a cable-receiving bore;

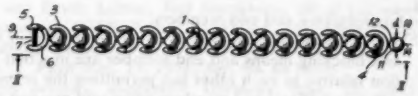
said female member adapted to receive said male head and to rotate thereon between open and closed positions, said male and female bores being generally aligned to receive a cable in said open position and offset to effect clamping forces on said cable in said closed position; and

means disposed between said male head and said female sleeve for adjusting the cable-receiving and cable-clamping capability of said device to enable the use of said device with cables of varying diameters.

4,014,079
BRACELET TYPE FASTENING DEVICE

Joseph Camarda, Garden City Park, N.Y., assignor to Les Bernard, Inc., New York, N.Y.

Filed June 10, 1975, Ser. No. 585,526
Int. Cl.² A44B 17/00
U.S. Cl. 24—201 HE **5 Claims**



1. A bracelet type fastening device for releasably affixing the ends of a bracelet type item to each other to secure the item around part of the body of a wearer, said bracelet type item having first and second opposite ends, said bracelet type fastening device comprising

a first fastening member pivotally affixed to the first end of a bracelet type item and having a substantially semicircular support part of predetermined diameter and a catch pin affixed to the support part and extending substantially diametrically thereacross, said first fastening member having a central plane therethrough and an axis in said plane, said pin being in said central plane; and

a second fastening member pivotally affixed to the second end of the bracelet type item and having a substantially spherical hook member having a diameter smaller than the predetermined diameter and a slot formed substantially radially therein for accommodating the pin of the first fastening member, said second fastening member having a central plane therethrough and an axis in said plane, said slot extending in a plane inclined at a predetermined angle of approximately 45° with said central plane and opening toward the item, the second fastening member on the part of the body of a wearer being pivotable relative to the item to an insertion and removal position in which the plane of the slot of the second fastening member is substantially perpendicular to the central plane of the first fastening member whereby the hook member is movable into and out of the support part of the first fastening member with the pin of the first fastening member being simultaneously moved into and out of the slot of the hook member, the second fastening member being further pivotable relative to the item to a secure position in which the item is normally worn on the part of the body of the wearer and in which the central planes of the first and second fastening members are substantially coplanar and the slot of the second fastening member extends at the predetermined angle with the central plane of the first fastening member whereby the portion of the hook member between the plane perpendicular to the central plane of the second fastening member and the plane of the slot prevents the removal of the hook member from the pin thereby securing the item around the part of the body of the wearer.

4,014,080

DEVICE FOR AUTOMATICALLY SEPARATING TWO SECTIONS OF A STRAP

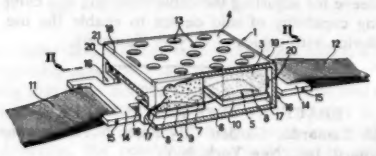
Alain Caradec, 183, Rue Paradis, 13006 Marseille, France

Filed Mar. 13, 1975, Ser. No. 558,152

Claims priority, application France, Mar. 20, 1974, 74.09501; Jan. 28, 1975, 75.02584

Int. Cl.² A44B *11/00*

U.S. Cl. 24—230 R **6 Claims**



1. Device for connecting two strap sections, each of which terminates in an end member, said device being adapted to permit the automatic separation of said sections and comprising:

a box receiving said end members;

blocking means blocking release of each end member when said blocking means and end member are in a first position relative to each other but permitting the release of either one of said end members when said one end member and said blocking means are in a second position relative to each other;

spring means biasing one of said end members away from said first relative position toward said second relative position; and

two tablets, one positioned to prevent movement of each end member away from said first relative position, one of said tablets being adapted to disintegrate in response to a predetermined ambient temperature and the other in response to a predetermined degree of humidity, thereby permitting the end member associated with the disintegrated tablet to move away from said first position and be released from said box.

4,014,081

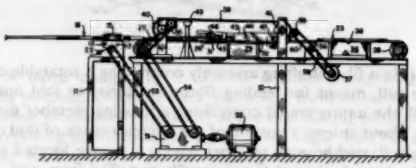
METHOD FOR PROCESSING OF SWEATER SECTIONS AND THE LIKE

Clifford Chandler Bryan, Statesville, N.C., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 488,672, July 15, 1974, abandoned. This application July 10, 1975, Ser. No. 594,742

Int. Cl.² D06C *5/00, 27/00*

U.S. Cl. 26—18.5 **12 Claims**



1. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions which comprises,

a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,

b. successively engaging each section by internal edge portions and simultaneously advancing and laterally distending each section by its said edges to a predetermined uniform width,

c. maintaining the section free of externally applied moisture, during lateral distention of the section,

d. successively discharging the distended sweater section onto endless supporting surfaces while disengaging said edge portions to accommodate differential lateral relaxation of the body and cuff portions of the sweater section.

e. grippingly engaging, supporting and conveying both faces of the disengaged section,

f. controlling the differential lateral relaxation of the sweater section by controlling the interval between the discharge of the distended section and the gripping engagement, support and conveying of both faces thereof,

g. thereafter steaming the differentially relaxed section over its entire area while engaged between said supporting surfaces, including the cuff, to accommodate further relaxation and adjustment and

h. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.

6. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions, which comprises

a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,

b. progressively distending each sweater section laterally to a flat form and to predetermined uniform width, by engagement of the section internally by its edges while advancing the section longitudinally,

c. progressively disengaging and discharging the edges of the section and accommodating differential lateral relaxation of the body and cuff portions thereof,

d. maintaining each portion of the sweater section free of externally applied moisture during lateral distention of the section,

e. thereafter, progressively grippingly engaging the sweater section lightly over its upper and lower faces and over a substantial longitudinal extent thereof by endless support-

ing surfaces and continuing to progressively advance the section,

f. controlling the differential lateral relaxation of the sweater section by controlling the interval between the discharge of the distended section and the gripping engagement, support and conveying of both faces thereof,

g. steaming the sweater section over its entire area while engaged between said supporting surfaces by progressively steaming the section in areas thus lightly gripped,

h. progressively releasing the steamed section and continuing to advance the section while supporting its lower face across the full width,

i. drying and cooling said section while continuing to support its lower face across the full width, and

j. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.

10. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions, which comprises

a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,

b. progressively distending each sweater section laterally to a flat form and to predetermined uniform width, by engagement of the section internally by its edges while advancing the section longitudinally,

c. progressively discontinuing lateral distention of the sweater section to accommodate progressive differential lateral relaxation of the sweater section,

d. maintaining distended portions of the sweater section free of externally applied moisture,

e. thereafter lightly engaging and gripping both faces of the sweater blank by endless supporting surfaces,

f. controlled lateral relaxation of the sweater section occurring in the interval between the discharge of the distended section from the flat form and the engagement of such section by the endless supporting surfaces,

g. thereafter steaming the sweater section over its entire area while engaged between said supporting surface and while said section remains in a differentially laterally relaxed condition, and

h. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.

4,014,082

METHOD AND EQUIPMENT FOR REMOVING REELING WASTE

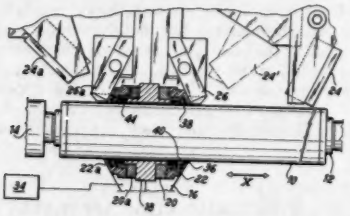
Mario Scaglia, Milan, Italy, assignor to M. Scaglia S.p.A., Italy

Filed Dec. 19, 1975, Ser. No. 642,383

Claims priority, application Italy, Dec. 19, 1974, 30754/74; Sept. 17, 1975, 27308/75

Int. Cl.² D03D *45/58*

U.S. Cl. 28—20 **20 Claims**



6. An equipment for removing reeling waste, left on a relatively elongated substantially cylindrical surface of a yarn support, for subsequent re-use of the yarn support, comprising, in combination, retaining, sintering and fastening means removably engageable with the yarn support at locations which do not interfere with such substantially cylindrical surface; a completely annular die ring having an inner diameter corresponding to the outer diameter of the substantially cylindrical surface and having a forelip engageable with the substantially cylindrical surface upon telescoping of said die ring over the substantially cylindrical surface adjacent one end of the latter; and means operable to effect relative axial displacement of said die ring and the substantially cylindrical surface to cause said die ring forelip to slide along the substantially cylindrical surface in circumferentially complete tight engagement with the latter, to engage the reeling waste and draw the same axially beyond the opposite end of the substantially cylindrical surface to strip the reeling waste therefrom.

4,014,083

DRAW-IN GRIPPER ASSEMBLY FOR DRAWING-IN WARP THREADS

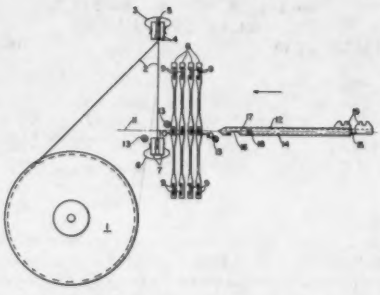
John Heinz, Berneck, Switzerland, assignor to Lindauer Dornier Gesellschaft mbH., Germany

Filed Aug. 5, 1975, Ser. No. 602,084

Claims priority, application Germany, Sept. 18, 1974, 2444566

Int. Cl.² D03J *1/14*

U.S. Cl. 28—46 **7 Claims**



1. A draw-in gripper assembly for drawing warp threads into weaving components comprising

holding means mounted above one another for holding in place a plurality of warp threads fed off of a beam,

each individual warp thread forming a loop outside of the clamping point of the upper holding means and being held in position by the lower holding means,

draw-in gripper means mounted above the lower holding means,

slider head means in said gripper means adapted to clamp a warp thread and pull it from said lower holding means during a draw-in stroke of said gripper means,

said warp thread held in a loop in said upper holding means being released, after a short delay, and, due to the length of thread so released, said warp thread is pulled through eye means of a weaving component,

and means for releasing said warp thread from the gripper means at the end of the draw-in stroke.

4,014,084

TEXTURIZING OF FILAMENTS

Wolfgang Bauer, Heidelberg; Wolfgang Martin, Ludwigshafen, and Erwin Lehrer, Bad Duerkheim, all of Germany, assignors to BASF Farben & Fasern Aktiengesellschaft, Hamburg, Germany

Filed Mar. 15, 1976, Ser. No. 667,090

Claims priority, application Germany, Mar. 21, 1975, 2512457

Int. Cl.² D02G *1/20, 1/16, 1/12*

U.S. Cl. 28—72.11 **6 Claims**

1. A process for crimping filaments by treating these filaments, conveyed by a heated gas, in a first treatment chamber and crimping them in an elongate second treatment chamber,

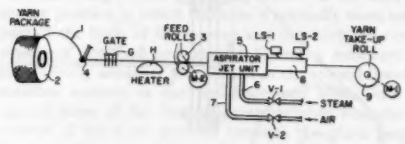
the temperature of which is kept at from 60° to 160° C, from which second treatment chamber the heated gas medium issues through longitudinal slits, wherein the stream of relatively cold gas is caused to impinge on the outside of a lower portion of the elongate second treatment chamber without allowing significant amounts of this relatively cold gas to enter the second treatment chamber.

4,014,085

STRING UP AND SHUTDOWN PROCESS FOR A YARN TEXTURIZING APPARATUS

Roger H. Fink, and William D. Porter, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 24, 1974, Ser. No. 517,787
Int. Cl.² D02G 1/12
U.S. Cl. 28—72.14 **16 Claims**



1. In a method for texturizing synthetic thermoplastic yarn in a bulking apparatus wherein a heated, dry gas is employed to convey a yarn into an initial portion of a bulking chamber to form a compact mass of yarn therein, the improvement which comprises introducing into said initial portion of said bulking chamber an auxiliary gas in place of and at a lower temperature than said heated gas during a short period of operation other than normal, continuous operation of said bulking apparatus to avoid overheating and fusion of the yarn within the initial portion of said bulking chamber and to thereby prevent plugging of the apparatus.

11. A method for controlling a process for the texturizing of multifilament synthetic polymeric yarn wherein the yarn is fed by a yarn feeder means into an aspirator jet supplied with a heated, dry gas, the yarn is passed in a stream of the heated gas to a bulking chamber in which the yarn filaments are caused to impinge against each other and to thereby form a compact yarn mass, and the yarn is withdrawn from the bulking chamber in the form of a yarn bundle by a take-up means, which comprises drawing the yarn from the feeder means into the aspirator jet and passing the yarn through the bulking chamber by introducing a gas at a lower temperature than said heated gas into said aspirator jet; securing the end of the yarn received from said bulking chamber onto a take-up device; initiating start-up of said process by introducing said heated dry gas into the aspirator jet and by simultaneously initiating operation of said feeder means and said take-up means and subsequently stopping the introduction of the lower temperature gas; and effecting shutdown of said process by stopping the introduction of heated gas into said jet, by deactivating said feeder means and said take-up means, and by again introducing the lower temperature gas into said aspirator jet and bulking chamber for a predetermined short period of time to prevent overheating of said yarn and plugging of said apparatus.

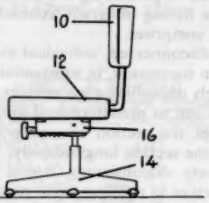
16. In a method for texturizing synthetic thermoplastic yarn in a bulking apparatus wherein a heated, dry gas is employed to convey a yarn into an initial portion of a bulking chamber to form a compact mass of yarn therein, the improvement which comprises introducing into said initial portion of said bulking chamber an auxiliary gas at a lower temperature than said heated gas to avoid overheating and fusion of the yarn within the initial portion of said bulking chamber and to thereby prevent plugging of the apparatus, said auxiliary gas being introduced into said initial portion of said bulking chamber during start-up and shutdown of said apparatus.

4,014,086

SAFETY FEATURE FOR CHAIR CONTROLS

Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada

Filed Aug. 4, 1976, Ser. No. 711,542
Int. Cl.² A47C 3/026
U.S. Cl. 297—303 **6 Claims**



1. In a chair control for a tiltable chair wherein a portion of the chair tilts rearward and downward when rearward pressure is applied to the back portion of the chair, said chair control comprising a fixed frame portion secured to the base portion of the chair, a moveable frame portion affixed to the undersurface of the seat portion of the chair and pivotally connected to said fixed frame portion, a biasing means adapted to return said moveable frame portion to a position of rest when the rearward pressure is released from the back portion of the chair, said biasing means comprising an elongated bolt with its head pivotally within said fixed frame portion and the shaft of said bolt extending through the moveable frame portion and marginally beyond, a helical spring inserted on the shaft of the bolt within the moveable frame portion, and a tension control means affixed to the peripheral end of the bolt, said tension control means comprising a pressure plate placed proximate the terminal end of the helical spring, a sheath encasing said elongated bolt between the pressure plate and the free end of the bolt and affixed to the pressure plate, the interior of said sheath being screw-threaded correspondingly to the peripheral end of said bolt, and a handwheel affixed to the end of the sheath exterior to the moveable frame portion, said tension control means adapted to control the tension in the helical spring, the improvement comprising the moveable frame portion having a downwardly depending plate on its front surface with an arch-shaped aperture centrally therein through which the sheath of the tension control means and the bolt of the biasing means extend and the sheath of the tension control means having a pair of ears on opposite sides thereof proximate said pressure plate, and a loosely fitting washer fitted around said sheath between the downwardly depending plate of the moveable frame portion and said ears.

4,014,087

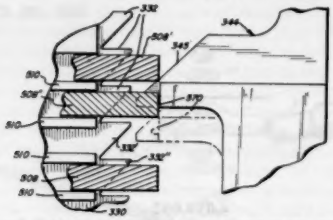
WIRE TERMINATION APPARATUS

William S. Cover, Glendale Heights, and Jacob S. Haller, Northbrook, both of Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Division of Ser. No. 576,192, May 9, 1975, abandoned. This application June 10, 1976, Ser. No. 694,671
Int. Cl.² H01R 43/04
U.S. Cl. 29—721 **15 Claims**

1. In combination with wire termination apparatus for successively terminating conductor wires in terminals arranged in

a series along the length of a connector and wherein there is relative motion between the connector and the wire insertion means in a direction longitudinally of the connector, and means to interrupt such relative motion for effecting alignment between the insertion means and successive terminals



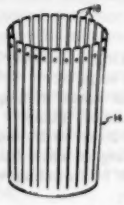
for inserting wires in said terminals, the improvement comprising means cooperable with said interrupting means for inactivating said interrupting means at predetermined alignment positions of said connector and said insertion means for skipping preselected terminals of said connector.

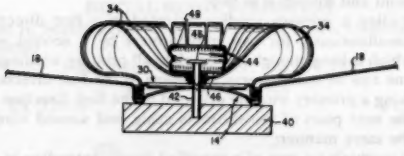
4,014,088

METHOD OF MAKING DECORATIVE ARTICLES

Jack A. Oshier, 36-16 Bell Blvd., Bayside, N.Y. 11361

Filed Jan. 27, 1976, Ser. No. 652,648
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 6 Claims





1. A method of making decorative articles such as Christmas tree ornaments, napkin holders, candle holders, artificial flowers, coasters, ash trays, centerpieces and the like from aluminum cans having a pair of end walls interconnected by a cylindrical wall, comprising the steps of

cutting off the top or bottom portion of a first can,

punching a series of holes of predetermined number and spacing in the outer surface of the first can cylindrical wall adjacent to the cut edge of the can,

cutting the cylindrical wall of the first can between the punched holes along the length of the can from the cut edge such that a predetermined number of strips of a predetermined size foldably connected to the remaining portion of the first can are formed,

bending the cut strips into an arcuate shape, and

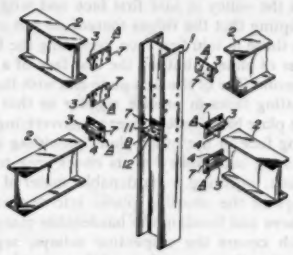
fastening the cut strips together by means of a fastener extending through the punched holes in each of the cut strips.

4,014,089

METHOD OF CONNECTING BEAMS AND COLUMNS OF STEEL FRAME CONSTRUCTION

Kuniaki Sato, Hiratsuka; Kozo Toyama, Tokyo; Eiji Matsushita, Fujisawa; Akio Tomita, Tokyo, and Shuei Suzuki, Machida, all of Japan, assignors to Kajima Corporation and Hitachi Metals, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 551,914, Feb. 21, 1975, Pat. No. 3,938,297. This application Dec. 8, 1975, Ser. No. 638,614
Int. Cl.² B23P *19/00*
U.S. Cl. 29—526 9 Claims



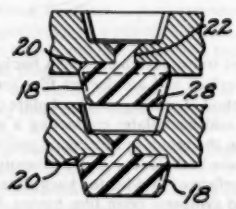
1. A method of connecting beams having an H-shaped section to a column having an H-shaped section of a steel frame construction by means of upper and lower flange fittings each comprising a substantially rectangular base plate to be connected to the column having centrally a continuous thicker portion from which the base plate is tapered toward opposite ends of the base plate, a supporting plate projecting from the thicker portion for supporting an upper flange of the beam and a reinforcement on the base plate forming a T-shaped portion with said supporting plate, characterized in comprising steps of securing said supporting plate of said upper flange fitting to one end of the upper flange of the beam in end-to-end relationship, bolting the base plate of said lower flange fitting in position to the column, placing one end of a lower flange of the beam onto said supporting plate of said lower flange fitting such that said base plate of the upper flange fitting secured to the upper flange of the beam is in contact with a surface of said column, securing the lower flange of the beam to the supporting plate of the lower flange fitting and bolting the base plate of the upper flange fitting to the surface of the column.

4,014,090

PATTERN PLATES AND METHOD OF MAKING SAME

Gerald R. Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa Lake, Mich., assignors to The Freeman Supply Company, Toledo, Ohio

Continuation of Ser. No. 416,099, Nov. 23, 1973, abandoned, which is a division of Ser. No. 257,930, May 30, 1972, Pat. No. 3,789,912. This application Mar. 10, 1975, Ser. No. 556,792
Int. Cl.² B22D *11/126;* B23C *3/13*
U.S. Cl. 29—527.4 13 Claims



1. A method of producing a plurality of pattern plates hav-

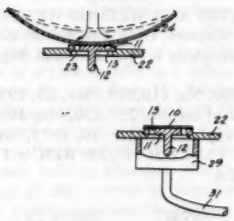
ing generally flat and parallel opposing faces each face of which has an imaginary center line formed by the intersection with said faces of an imaginary plane that is perpendicular to said faces, said method comprising: forming a valley in a first face of a first plate which valley has opposing side surfaces that are defined by concave surface indentations with the bottom of said indentations being aligned so that the cross section of the valley as defined by the aligned bottoms is an isosceles trapezoid, said side surfaces having ridges between the indentations which are irregularly spaced, forming a valley in the portion of the second face of the first plate as presented by rotation of the plate about a center line in the identical position as the valley in said first face and with an identical shape excepting that the ridges thereof do not correspond in position to those in said first face, repeating the forming steps in a number of plates, abutting the first face of a second plate with the second face of the first plate and with the center lines of the abutting faces in precise register so that the abutting face of one plate has a valley cover area overlying the valley in the abutting face of the other plate, providing a passageway communicating each valley or its cover area to an external plate surface, injecting a hardenable material through the passageways of the abutting plates into the valleys of the abutting faces and bonding the hardenable material onto the plate which covers the respective valleys, separating said plates, abutting the second face of the second plate with the first face of another plate and with the center lines of the abutting faces in precise register so that the abutting face of one plate has a valley cover area overlying the valley in the abutting face of the other plate, said plates having a passageway communicating each valley or its cover area to an external plate surface, injecting a hardenable material into the valleys of the abutting faces of said second and other plates and bonding the cast material onto the plate which covers the respective valley, and whereby objects cast from opposite sides of said plates have lugs with convex projections and have valleys with ridges in their side surfaces which projections and ridges engage each other when the objects are matched.

4,014,091

METHOD AND APPARATUS FOR AN ELECTRET TRANSDUCER

Yoichi Kodera, and Tetsuo Toyoda, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 22, 1972, Ser. No. 282,765
Claims priority, application Japan, Aug. 27, 1971, 46-65679
Int. Cl.² H01S *4/00*; H04R *31/00*
U.S. Cl. 29—592 **7 Claims**



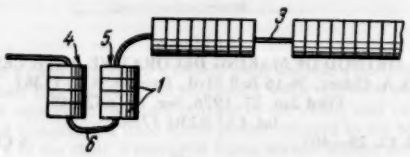
1. In an electret transducer including a backplate having a flat conductive surface and an electret film formed thereon, the improved method of making said backplate comprising the steps of heating said backplate; contacting a synthetic resin film selected from the group consisting of polytetrafluoroethylene and fluorinated ethylenepropylene copolymer with said flat conductive surface of said heated backplate to secure said film thereon, said synthetic resin film having a capability of forming electret, charging said synthetic resin film to form an electret, wherein said backplate has a plurality of holes and a plurality of holes are formed in said film in alignment with said plurality of holes in said backplate and wherein said backplate is heated to the range 280°–400° C, and wherein contacting said resin film to said heated backplate is accomplished such that the film initially contacts a point on said backplate and from said point is progressively brought into contact with areas of said flat conductive surface.

4,014,092

METHOD FOR MAKING MEMORY PLANE FOR MAGNETIC DECODER

Jury Alexandrovich Burkin, Tsvetnoi proezd, 29, kv. 24, and Jury Valentinovich Metlyaev, ulitsa Ilicha, 5, kv. 40, both of Novosibirsk, U.S.S.R.

Filed Nov. 25, 1975, Ser. No. 635,104
Int. Cl.² H01F *41/08*
U.S. Cl. 29—604 **1 Claim**



1. A method of making a memory plane of a magnetic decoder comprising the steps of:

taking toroidal ferrite cores in a quantity sufficient for wiring the entire memory plane;

stringing said ferrite cores in a column on a wire which forms a bias winding of each transformer and is long enough to complete bias windings of all the transformers of a memory plane;

separating a number of ferrite cores required for winding two transformers one by one from said column of cores;

bending said wire threading the separated cores at a midpoint and folding it in two;

threading a primary winding oriented in a first direction simultaneously for two transformers by a second wire which is long enough to complete all primary windings in one row of transformers extending in the first direction;

making a primary winding oriented in the first direction for the next pairs of transformers using said second wire in the same manner;

and producing a row of a specified length extending in the first direction out of these pairs of transformers;

threading in the same way the primary row of the first direction through the cores of transformers of the next row and the entire number of rows extending in the first direction to form a strip of transformers;

bending said strip of transformers in a zigzag manner at points between primary windings oriented in the first direction so as to form a memory plane of a decoder;

threading pairs of transformers by a third wire in a direction transverse to said strips of transformers producing thereby primary windings oriented in the second direction;

the third wire being long enough to complete all the primary windings of all the transformers oriented in the second direction;

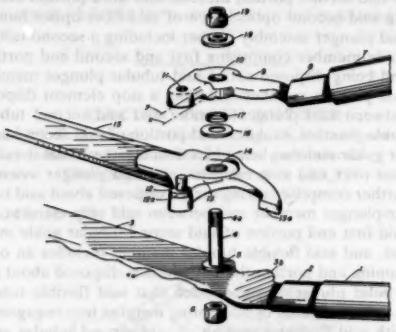
making secondary windings for each transformer separately and taking the ends of said windings outside a memory plane.

4,014,093

HEDGE SHEARS

David H. Keiser, Jr., 53 Park Road, Wyomissing Hills, Pa. 19610

Filed Nov. 20, 1975, Ser. No. 633,703
Int. Cl.² A01G 3/04
U.S. Cl. 30—248 1 Claim



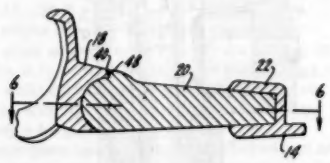
1. Hedge shears comprising a blade and integral handle in substantially linear relationship, a post integrally secured at right angles to the end of the blade portion closest to the handle, a second handle having, integrally secured to the end thereof, a driving element of angle shape having a central vertical hole into which said post projects to provide a pivot and having a vertically and upwardly offset end portion with a vertical hole, a second blade integrally connected to a driven element having, on a lateral extension thereof, an upstanding integral stud which loosely fits into said lastmentioned vertical hole and having a substantially central hole fitting over said post, a resilient washer located between said driving and driven elements and surrounding said post, and means attached to the extreme end of said post for holding said driving and driven elements and intermediate resilient washer close together, whereby said stud has a force applied thereto as the result of the moment arm from said vertically offset relationship of said end portion.

4,014,094

DENTAL HINGE STRUCTURE

Allan H. Schumann, 3405 N. Countryside Drive, McHenry, Ill. 60050

Filed July 24, 1975, Ser. No. 598,792
Int. Cl.² A61C 13/22
U.S. Cl. 32—5 9 Claims



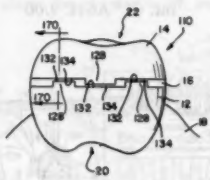
1. A hinge product assembly for use in constructing hinged connections between artificial partial dentures and supporting natural teeth; said assembly comprising a bar, a pivot member and an attachment member; said bar being of generally rectangular cross-section having a cylindrical end surface having an axis at right angles to the longitudinal axis of said bar; said surface terminating in a shoulder extending across the bar parallel to the axis of said surface; said pivot member comprising a generally three sided hood shaped structure having interior surfaces closely conforming to the shape of said cylindrical end surface of said bar and loosely assembled thereto; the opposite end of said bar having securing means thereon and said attachment member surrounding said opposite end and in engagement with said means.

4,014,095

RESILIENT ARTIFICIAL DENTURE TOOTH

Henry C. Heimansohn, Danville, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 532,513, Dec. 13, 1974, Pat. No. 3,958,334. This application Oct. 8, 1975, Ser. No. 620,251
Int. Cl.² A61C 13/00
U.S. Cl. 32—8 17 Claims



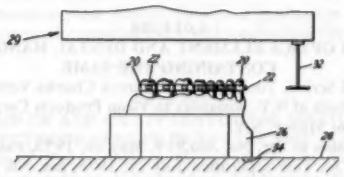
1. An artificial tooth for use in a denture, said tooth comprising a base portion, an occlusal portion and an intermediate portion, said base portion and occlusal portion each providing surfaces for securing said intermediate portion in sandwiched relation therebetween, said intermediate portion being resilient to permit said occlusal portion to move yieldably relative to said base portion, and a plurality of tabs for limiting movement of said occlusal portion relative to said base portion, said tabs projecting from at least one of said surfaces toward the other of said surfaces about the outer perimeter of one of said occlusal and base portions.

4,014,096

METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT

Eugene L. Dellinger, 1326 Old Lantern Trail, Fort Wayne, Ind. 46825

Filed Mar. 25, 1975, Ser. No. 561,697
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 A 31 Claims



1. A method of orthodontics for correcting malocclusion comprising the steps:

a. securing blank brackets in predetermined position to the teeth, respectively, in a patient's mouth,

b. making an impression of the patient's teeth with the blank brackets in place,

c. removing the blank brackets from the patient's mouth and placing them in the respective bracket portions in the impression,

d. forming a working cast from the impression with the blank brackets in place,

e. sectioning the teeth from the working cast, securing said cast teeth in a master matrix unit in the desired occlusion thereof,

f. forming arch wire slots in said blank brackets mounted on the cast teeth in positions corresponding to the original

positions on the patient's teeth while secured to said matrix unit in predetermined locations,

g. replacing said slotted brackets onto the patient's teeth in the original positions thereof, and

h. attaching an arch wire device to said brackets.

4,014,097

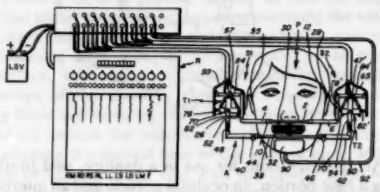
METHOD AND APPARATUS FOR MEASURING AND RECORDING THREE-DIMENSIONAL CONDYLERMOVEMENTS OF THE MANDIBLE

Cornelis H. Pameijer, Wakefield, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Aug. 14, 1975, Ser. No. 604,785

Int. Cl.² A61C 9/00

U.S. Cl. 32—20 **4 Claims**



1. Apparatus for recording condylar movements of the mandible joints of a patient when the jaws and teeth are worked, said apparatus including a pair of pressure sensing housing units having sensing elements yieldably supported therein, an upper stationary U-shaped frame structure for supporting the housing units at either side of the head of the patient along a common axis of hinging of the mandible joints, means for securing the U-shaped frame structure to the maxillary teeth of the patient, a pair of pressure transmitting actuator units having contact elements adjustably supported therein; a lower U-shaped frame structure for supporting the actuator units in nested relationship in the housing units and lightly engaging the said contact elements with respective sensing elements of the housing units, means for securing the lower frame structure to the mandibular teeth of the patient, and means for recording displacement of the sensing elements by forces transmitted through the actuator contacts in response to condylar movements of the mandible.

4,014,098

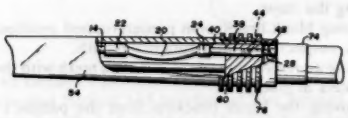
FIBER OPTICS ELEMENT AND DENTAL HANDPIECE CONTAINING THE SAME

Leonard Scrivo, Tuckahoe, and Warren Charles Vetter, Glendale, both of N.Y., assignors to Vicon Products Corporation, Pelham Manor, N.Y.

Division of Ser. No. 360,919, May 16, 1973, Pat. No. 3,897,134. This application July 21, 1975, Ser. No. 597,191

Int. Cl.² A61C 1/08

U.S. Cl. 32—26 **5 Claims**



1. A dental drill handpiece comprising:

a head member defining a turbine within said housing;

a drive shaft extending outwardly from said turbine;

a handle means comprising an elongated hollow shaft attached to said head member;

A fiber-optics element comprising a fiber-optics bundle having first and second end portions, terminating in first and second optical faces, respectively, a first tubular guide member disposed about a first portion of said fiber-optics bundle, a flexible tubular member disposed about a second portion of said fiber-optics bundle disposed adjacent to said first portion thereof, and a plunger assembly comprising a tubular plunger member disposed about a third portion of said fiber-optics bundle disposed adjacent to said second portion thereof, said third portion including said second optical face of said fiber-optics bundle, said plunger assembly further including a second tubular guide member comprising first and second end portions and being disposed about said tubular plunger member, said plunger member including a stop element disposed between said plunger member and said second tubular guide member, said first end portion of said second tubular guide member being of a diameter such that it cannot pass over said stop element, and said plunger assembly further comprises spring means disposed about said tubular plunger member and between said stop element and said first end portion of said second tubular guide member, and said flexible tubular member includes an overlapping end portion thereof which is disposed about said tubular plunger member such that said flexible tubular member is biased by said spring member into engagement with said first end portion of said second tubular guide member which first end portion thus serves as a stop for said flexible tubular member such that said fiber-optics element comprises a self-supported plunger assembly;

said fiber-optics element being disposed in said handle means and head member in a manner such that said first optical face of said fiber-optics bundle is rigidly retained by said head member and said second optical face of said fiber-optics bundle and said third portion of said fiber-optics bundle extends rearwardly from said handle means whereby the second optical face can be depressed into said second tubular guide member by pressing a third optical face against said second optical face to compress said spring and bend said flexible tubular member to maintain a biasing force on said second optical face tending to force said second optical face out of said second tubular guide member and into engagement with said third optical face.

4,014,099

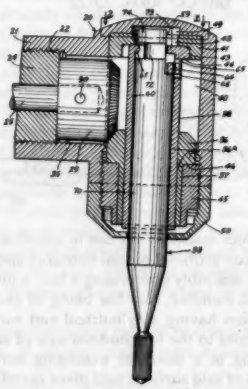
DENTAL HANDPIECE

Ronald L. Bailey, St. Peters, Mo., assignor to Young Dental Manufacturing Company, Hazelwood, Mo.

Filed Jan. 29, 1975, Ser. No. 544,910

Int. Cl.² A61C 1/10

U.S. Cl. 32—27 **18 Claims**



1. In a dental handpiece comprising an instrument holder, having a tubular recess to receive a dental instrument with a

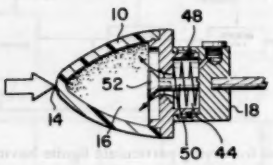
shaft insertable in the recess the holder having releasable holding means to secure the dental instrument in the recess of the instrument holder to prevent the instrument's removal but releasable to allow removal by a pull of the finger, the hollow also having a drive means for engagement with the instrument to rotate the dental instrument with the instrument holder, and the holder having additional means rendered aperature by operation of the drive means to prevent the removal of the instrument while the instrument holder and instrument are in motion.

4,014,100

ELECTRIC TOOTH POLISHER

Frederick P. Spotteck, Middle Village, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,125
Int. Cl.² A61C 3/06
U.S. Cl. 32—59 **4 Claims**



1. Tooth polishing apparatus comprising:

a generally conically shaped hollow rigid porous polishing head, the base of the head having an orifice;

a shallow hollow cylinder having a vent, said cylinder being secured to said base with the orifice communicating with the interior of the cylinder, said cylinder containing a liquid dentifrice;

valve means disposed partially in the head and partially in the cylinder, said means having a normally closed position at which the orifice is sealed, said means opening the orifice to allow the dentifrice to flow into the head and out of the pores when the head is inverted and the head and cylinder are squeezed together; and including a hand held electrically operated means for rotating said head whereby teeth can be polished by the impregnated head.

4,014,101

ELLIPSE DRAWING INSTRUMENT

Suehiro Mizukawa, Shijonawate, Japan, assignor to Shinichi Yamaoka, Japan

Filed Nov. 24, 1975, Ser. No. 634,734
Claims priority, application Japan, Dec. 4, 1974, 49-141294
Int. Cl.² B43L 11/04
U.S. Cl. 33—30 R **1 Claim**

1. An ellipse drawing instrument comprising:

a base plate adapted to be placed on a surface on which an ellipse is to be formed, said base plate having upstanding side walls each having a guide groove therein,

a swivel arm rotatably mounted on said base plate and having a longitudinal slit therein,

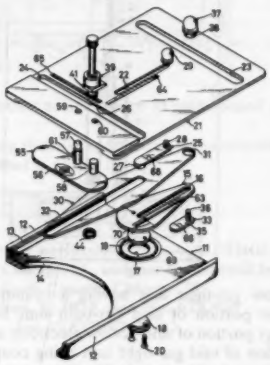
a movable plate mounted above said swivel arm and slidable in said guide grooves so as to be movable in a longitudinal direction, said movable plate having a pair of parallel transverse slits suitably spaced from each other and a single longitudinal slit disposed between said transverse slits substantially midway between the sides of said movable plate,

a fulcrum member having a fulcrum at one end thereof mounted on said movable plate at a position adjustable along said longitudinal slit therein,

a swaying lever having a hole at one end thereof and a longitudinal slit therein extending from the other end thereof about halfway along its length and mounted between said movable plate and said swivel arm with said fulcrum fitting in said longitudinal slit in the swaying lever so as to be swayable around said fulcrum while moving longitudinally with said movable plate,

an adjusting member having a shaft projecting upward from one end thereof, said shaft fitting in said longitudinal slit in the swivel arm, said hole in the swaying lever and said one transverse slit in the movable plate to couple these three members together, said swivel arm having a recess in under side thereof along said slit in which said adjusting member is received to permit adjustment of its position therealong,

an ellipse forming implement carriage slidably mounted in said other transverse slit in the movable plate and in said longitudinal slit in the swaying lever, and



a positioning member having two studs projecting from the upper face thereof and turnably and removably mounted under said movable plate adjacent to said other transverse slit, said movable plate having two holes therein in which said studs are removably fitted,

said positioning member having thereon a center mark to indicate the center position of an ellipse to be drawn at an intersecting point between said other transverse slit and an extension of said longitudinal slit in the movable plate,

said swivel arm having thereon a graduation for the length of the major axis of the ellipse and extending in the direction along which the position of said adjusting member is adjustable, and

said movable plate having thereon a graduation for the ellipse angle extending along said longitudinal slit therein.

4,014,102

METHOD OF AND AN APPARATUS FOR MEASURING THE ELECTRODE LENGTH IN AN ELECTRIC FURNACE

Hideo Haga, Tokyo; Mitosi Kosugi, Ichikawa; Yoshiyuki Kimura, Funabashi, and Masakazu Takabatake, Ichikawa, all of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,452
Int. Cl.² G01B 5/18
U.S. Cl. 33—126.6 **17 Claims**

1. An apparatus for measuring the electrode length in an electric furnace, comprising:

a hollow electrode having a lower portion buried in a layer of

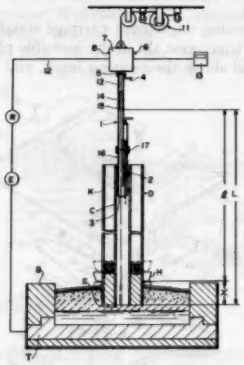
a process material within the electric furnace;

a lead wire having one end portion suspended outside and above said hollow electrode;

lead wire take-up means for lowering and raising said one end portion of said lead wire through the interior of said hollow electrode, said lead wire take-up means comprising a gas-tight box provided with a gas exhaust duct, a take-up roller disposed within said gas-tight box and

driven by a drive source to lower and raise the lead wire, a tensioning roller, a guide roller for guiding an end portion of the lead wire vertically into said hollow electrode, and a measuring roller disposed between the tensioning roller and the guide roller;

an electric circuit including said lead wire, a power supply and the process material within the electric furnace, said electric circuit being energized when said one end portion of said lead wire comes into contact with said process material within said furnace;



a hollow gas-tight unit having a cylindrical interior, the lower portion of said gas-tight unit being fitted in an upper portion of said hollow electrode and the upper end portion of said gas-tight unit being coupled with a lower portion of said gas-tight box in communication with the interior of said gas-tight box, said one end portion of said lead wire being passed through the interior of said gas-tight unit; and

measuring means coupled with said wire take-up means for measuring the length of descent of said lead wire when said electric circuit is energized.

4,014,103

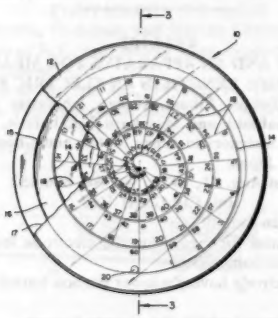
MEASURING DEVICE

Leo Roth, 52-27 69th St., Maspeth, N.Y. 11377

Filed Sept. 17, 1975, Ser. No. 614,859

Int. Cl.² G01B *3/12, 7/04*

U.S. Cl. 33—141 R **2 Claims**



1. A distance measuring device having a peripheral housing of circular configuration, a base member providing the bottom surface of the device and secured to said housing, a transparent cover disposed over said peripheral housing, a spiral guide supported on said base member under said cover, said guide winding spirally from said housing and terminating proximate the axial center of said device and a ball marker confined by said cover and base member within the device and adapted to travel along the guide as the device is rolled from one point to another the distance between which measurement is desired.

4,014,104

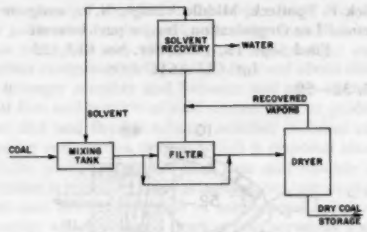
DRYING OF LIGNITE USING NONAQUEOUS SOLVENTS

Charles L. Murphy, Smyrna, Ga., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 23, 1975, Ser. No. 589,096

Int. Cl.² F26B *3/00*

U.S. Cl. 34—9 **4 Claims**



1. A process for drying particulate lignite having an interstitial moisture content of at least 38 percent by weight comprising:

a. adding a nonaqueous solvent to said particulate lignite, said solvent having a heat of vaporization less than half that of water, a boiling point below 85° C, and being miscible with water, whereby a portion of said interstitial moisture is replaced by said solvent;

b. applying heat to said lignite to which said nonaqueous solvent has been added to vaporize water and solvent therefrom with the amount of solvent vaporized being proportionally greater than the amount of water vaporized whereby the ratio of solvent to water in the lignite is reduced by said heating; and

c. recovering said solvent.

4,014,105

ARTICLE, APPARATUS AND METHOD FOR CONDITIONING FIBROUS MATERIALS WITH LIQUID CONDITIONING COMPOSITION

Henry P. Furgal, Bernardsville, and Ingrid A. Larsen, Cranbury, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 82,313, Oct. 20, 1970, abandoned. This application Mar. 2, 1973, Ser. No. 337,352

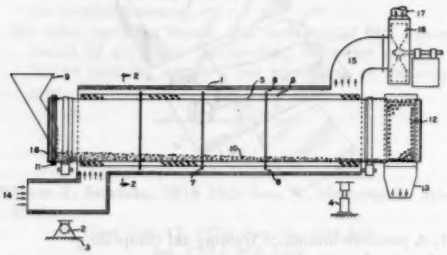
Int. Cl.² F26B *7/00*

U.S. Cl. 34—12 **4 Claims**

1. An apparatus for softening laundry during the drying thereof which comprises an automatic laundry dryer of the substantially horizontally rotating tumbling drum type, having means for heating air and means for circulating such air through the tumbling laundry and having therein a fabric softening article which comprises a dispensing container for a

liquid fabric softening composition, which container has a plurality of permanent and unvalved openings of cross-sectional areas in the range of 0.001 to 0.1 sq. cm. over at least a portion of the surface thereof, through which liquid fabric softening composition is gradually dispensable during tumbling of the container in contact with laundry to be softened during operation of the automatic laundry dryer, and a liquid fabric softening composition in the container which includes a softening agent selected from the group consisting of surface active synthetic organic anionic, nonionic, cationic, anionic-nonionic and cationic-nonionic fabric softening agents and is of a viscosity in the range of about 0.3 to 5 centipoises.

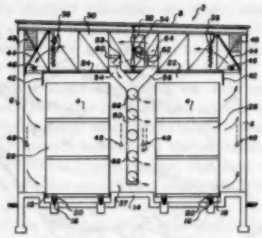
4,014,106
DRYER
Wendell E. Bearce, Box 241, St. Clairsville, Ohio 43950
Filed June 20, 1975, Ser. No. 588,673
Int. Cl.² F26B *11/04*
U.S. Cl. 34—142 **2 Claims**



1. A dryer for drying wet coal particles and the like, comprising a stationary, insulating, substantially cylindrical shell, a cylindrical metallic tube coaxially mounted within said shell in spaced relationship therewith, means for feeding the wet coal particles through a relatively large opening in one end of said tube, means for rotating said tube about its axis, thereby distributing wet coal particles throughout the entire length of said tube, a cylindrical screen mounted on the other end of said tube, an outlet chute immediately below said screen, means for circulating hot air longitudinally through the space between said tube and shell including an exhaust fan, a plurality of radially outwardly extending fins integrally secured along spaced outer portions of said tube for more effectively transferring heat from the exterior to the interior surface of said tube, certain of said fins extending longitudinally throughout the entire length of said tube and being perforated throughout their length, and a plurality of metallic balls in said tube mixed with said particles whereby after said coal particles are dried, they are rotated in said screen and discharged by gravity through said outlet chute and screened from said balls.

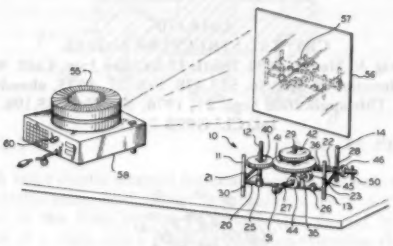
4,014,107
DRYING KILN FOR LUMBER
Jakob L. Bachrich, 3453 Wellington Cresent, North Vancouver, British Columbia, Canada (V7R 3B3)
Filed Apr. 7, 1976, Ser. No. 674,518
Int. Cl.² F26B *21/06*
U.S. Cl. 34—191 **10 Claims**

1. A drying kiln for lumber comprising
a drying chamber having two spaced drying sections each to receive a stack of lumber;
a second chamber above the drying chamber;
drivable, reversible, circulating means in the second chamber;
heating means for air circulated by the circulating means;
a first passageway permitting the circulating means to force heated air across the drying sections, across the space between them and back to the circulating means;
a second passageway extending downwardly into the space between the dryer sections;
a first and second closable inlet for the second passageway, each inlet positioned on a side of the circulating means to receive a proportion of air forced towards it by the circulating means;



a plurality of outlets to said space in said second passageway; and
means controlling the first and second inlets whereby if one is open the other is closed.

4,014,108
VISUAL PERCEPTION TESTING METHOD
Edward J. Hester, Chicago, Ill., assignor to Goodwill Industries of Chicago and Cook County, Chicago, Ill.
Filed Nov. 5, 1975, Ser. No. 628,920
Int. Cl.² G09B *25/02*
U.S. Cl. 35—13 **2 Claims**

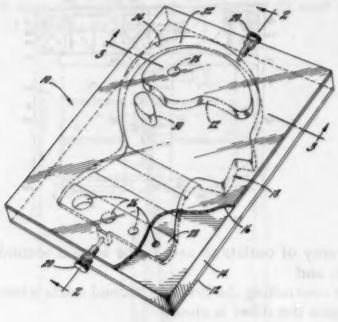


1. A method of conducting tests for visual perception comprising the steps of:
a. building a machine from modular parts which may be added, removed, or changed to alter the physical appearance of said machine;
b. photographing said machine in each of its altered physical appearances and from a plurality of different angles and view points,
c. setting said machine in one physical form adjacent a screen in view of the person being tested and
d. projecting said photographed pictures on said screen in timed succession, whereby the person being tested must determine whether each projected picture depicts the same physical form or a different form that the adjacent machine.

4,014,109
TEST APPARATUS FOR NUCLEAR IMAGING DEVICES
Douglas Schramm, Winfield, Ill., assignor to Anasim, Inc., Aurora, Ill.
Filed Feb. 12, 1975, Ser. No. 549,166
Int. Cl.² G09B *23/28;* **G21K** *3/00*
U.S. Cl. 35—17 **7 Claims**

1. A test phantom for evaluating the scan of a nuclear

imaging device which comprises a container having a sealed cavity therein, the outer walls simulating the outline of a human head and the cavity having a predetermined depth, a means for allowing injection of a radioisotope into the cavity, a first insert located in said cavity and at least substantially simulating the shape and location of the human brain, said first insert having a depth simulating, after addition of the



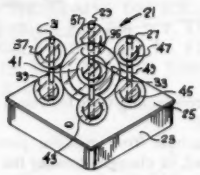
radioisotope to fill the cavity and on a scan of the test phantom, an area discernible on the scan substantially equivalent to the human brain, a second insert located adjacent the first insert and having a depth substantially equal to that of the cavity and simulating on a scan an area which is substantially white and said first insert having at least a partial void located therein simulating on a scan an area discernible from the remainder of said first insert.

4,014,110

CRYSTAL STRUCTURE MODEL

Ludwig A. Mayer, 4492 Thistle Drive, San Jose, Calif. 95136

Continuation of Ser. No. 553,478, Feb. 27, 1975, abandoned.
This application Sept. 21, 1976, Ser. No. 725,196
Int. Cl.² G09B *23/26*
U.S. Cl. 35—18 A **7 Claims**



1. A kit for demonstrating crystal structure models comprising,

a planar base defining a first number of fixed location holes therein, said fixed location holes at locations corresponding to superposed sphere center projections of tangent spheres of different sizes from all models to be demonstrated,

a multip.icity of templates, each template adapted for detachable joinder to said base and each template defining a unique hole pattern therein exposing a second number of holes in said base lesser than said first number when a template is detachably joined to said base, said hole locations in each template corresponding to sphere centers of tangent spheres of different sizes projected onto a plane parallel to the plane of said base wherein said sphere centers represent positions in a crystal structure,

a plurality of rods, each having a proximal end disposed in one of said exposed holes of said base, and a distal end projecting away from said base, and

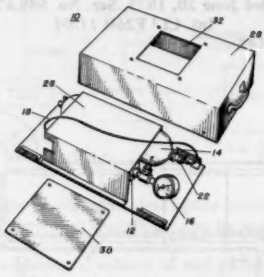
a multiplicity of spheres, having at least first and second sizes having axial holes therethrough of a hole diameter slightly larger than the diameter of said rods mounted in movable relationship to said rods with each sphere size specifically correlated with exposed base holes to be tangent to at least one neighboring sphere.

4,014,111

ORDNANCE TRAINING AID

Ralph L. Miller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,028
Int. Cl.² G09B *9/00*
U.S. Cl. 35—25 **1 Claim**



1. A portable ordinance training aid comprising:

a housing having a cover portion;

a base portion removably attached to said cover portion;

a pair of gas pressurized cylinders in said housing;

a bulkhead for mounting said cylinders on said base portion;

an inlet valve for pressurizing said cylinders;

a tube connecting said pressurized cylinders to equalize pressures therein;

a pressure gage attached to at least one of said cylinders; and

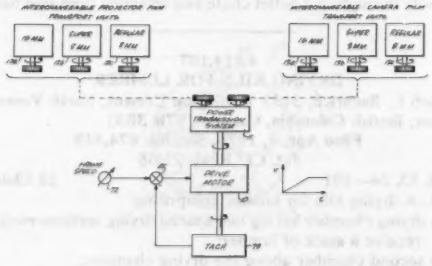
an aperture in said housing for access to said tube.

4,014,112

OPTICAL MOTION PICTURE FILM PRINTER

Rodger L. Christopherson, Chatsworth, and George J. Sorokin, Woodlands Hills, both of Calif., assignors to PSC Technology, Inc., Glendale, Calif.

Filed June 2, 1975, Ser. No. 582,602
Int. Cl.² G03B *27/48*
U.S. Cl. 355—50 **18 Claims**



1. An optical motion picture film printer having a projector station, a camera station, drive motor means for transporting film at the stations, and means for projecting light from the projector station to the camera station, in which the improvement comprises, for at least one of the stations:

a plurality of interchangeable film transport units for handling different film formats, each film transport unit including an input gear, drive sprocket means driven by the input gear, and incremental film advance means driven by the input gear for handling the corresponding film format, thereby transporting film past an aperture through which the light passes as the input gear rotates; and

means for individually and removably receiving any one of the film transport units at the station to couple the drive motor means to the drive sprocket means and the incremental film advance means of the received film transport unit so as to transport the film handled thereby, the receiving means having means for removably securing the received film transport unit at the station and an output gear that

rotates responsive to the drive motor means,

is engageable with the input gear of the received film transport unit when such unit is secured by the securing means, and

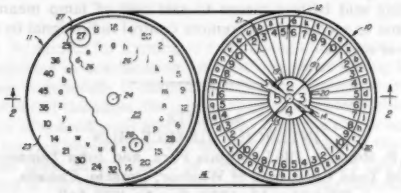
is free to move out of engagement with the input gear of the received film transport unit as such unit is removed from the receiving means;

the drive sprocket means and incremental film advance means of each unit transporting the same number of frames past the aperture per revolution of the output gear.

4,014,113
COMPUTATION WORD BUILDER

William T. Bowman, 2816 29th Ave. S., Minneapolis, Minn. 55406

Filed Jan. 12, 1976, Ser. No. 648,113
Int. Cl.² G09B 3/04
U.S. Cl. 35—74 15 Claims



1. Apparatus for improving the skills of mathematical computation and alphabet usage, comprising a computation selector in combination with an answer verifier,

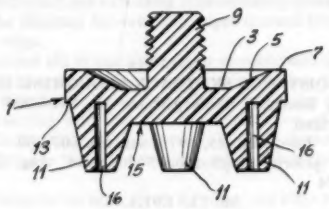
i. said computation selector consisting essentially of a problem board member and a selector member, said problem board member having a central point, means uniting said computation selector members together for relative rotary movement of one with respect to the other about said central point of said problem board member, said problem board member carrying on it visible indicia arranged in circumscribing fashion about said central point, said indicia including an inner array of primary numbers and an outer array of secondary numbers, said inner array comprising at least two said primary numbers, each said primary number being separated from adjacent ones thereof by a primary radial line separator, whereby each said primary number lies within a radial primary segment about said central point, said outer array of secondary numbers being radially outward from said primary numbers and being arranged with at least three said secondary numbers within the arc ambit of each said radial primary segment, each said secondary number lying within a radial secondary segment defined by secondary radial line separators between said secondary numbers, substantially all of said secondary numbers having associated therewith a visible letter code, each said letter code being representative of the numerical value of the correct answer for a predetermined mathematical computation between the said secondary number with which said letter code is associated and the primary number within the arc ambit of whose radial primary segment the said secondary number is located, different said correct answer numerical values being represented by a different said letter code,

ii. said answer verifier comprising an answer board member and a visibly distinct identifier member, means uniting said answer verifier members together for relative indexing movement of one with respect to the other, said answer board member carrying on it indicia comprising each said letter code appearing on said computation selector, each said letter code on said answer board member having in uniform association with it the numerical value of said correct answer for the aforesaid predetermined mathematical computation, the said correct answer numerical value associated with each letter code on said answer board being visually apparent and identified by said identifier member when said identifier member is indexed to visually mark said letter code with which said correct answer numerical value is associated.

4,014,114
SPIKE CLUSTER

Ulice A. Jordan, and Governor V. Quinn, both of East St. Louis, Ill., assignors to Three Line Research & Development Co., Inc., Granite City, Ill.

Filed Nov. 28, 1975, Ser. No. 635,892
Int. Cl.² A43C 15/00
U.S. Cl. 36—67 D 11 Claims

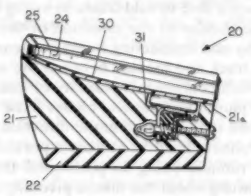


1. A spike cluster adapted for attachment to the bottom of an athletic shoe, said cluster comprising a body portion, means on the body portion for attachment thereof to the bottom of a shoe, and a plurality of spikes extending downwardly from said body portion, each spike having a vertical bore therein open at the bottom of said spike.

4,014,115
DECORATOR HEEL/SHOE COMBINATION

Robert J. Reichert, 118 Prospect St., Clyde, Ohio 43410

Filed June 9, 1975, Ser. No. 585,386
Int. Cl.² A43B 23/00
U.S. Cl. 36—137 1 Claim



1. A shoe comprising:

1. a principal body including a sole, an upper attached foot-enclosing member and a heel-engaging connector, and

2. a removable heel adapted to removably engage said connector, said heel being formed of a hardened translucent plastic, said heel having a vertical forward face and an upper horizontal face in flush engagement with said connector, said heel including two formed interconnecting recesses or cavities, one of said cavities being proximate said upper surface and containing at least one disk-type battery having a central planar terminal and an edge terminal, said lower cavity containing a bulb energizable by said battery and having two terminals, a first connector encircling said bulb base to contact one of said bulb terminals and extending to said upper cavity to engage said planar terminal of said battery, and a second connector extending upwardly to proximate said disk-type battery edge terminal and spaced therefrom, said second connector being shiftable into and out of contact with said other terminal of said bulb, a laterally movable screw extending from said forward face to said lower inner cavity and movably operative to shift said second connector against said other bulb terminal, said battery being shiftable by the weight of the shoe wearer to accomplish contact between said battery edge terminal and said second conductor and thereby illuminate said bulb only if said screw is holding said second connector against said other bulb terminal.

4,014,116

LONG-DISTANCE SKI-TRACK PLOUGHING DEVICE

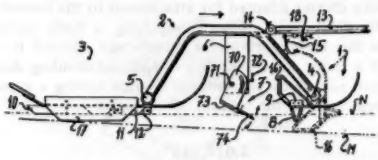
Anton R. Baechler, Seeburgstrasse 10, CH-6006 Lucerne, Switzerland

Filed Aug. 25, 1975, Ser. No. 607,604

Claims priority, application Switzerland, Aug. 28, 1974, 011708/74

Int. Cl.² E01H *4/00*

U.S. Cl. 37—10 **3 Claims**



1. In a long-distance ski-track-ploughing device comprising a track sled adapted to be towed by a vehicle in the direction of the track, tracking elements on the underside of said sled oriented in the direction of the track, a forward sled joined to the track sled by means of a connecting frame, means pivotally connecting each sled to said frame to swing about a horizontal axis perpendicular to the direction of the track, and a scraper carried by said connecting frame perpendicular to the direction of the track and located between the said sleds, the improvement which comprises a plurality of lateral guides on the track sled, a plurality of vertical blades fixed to the underside of the forward sled oriented in the direction of the track, and additional runners fixed to at least a portion of said forward sled, said runners being so positioned that when said forward sled is swung about the means pivotally connecting it to said frame, from an operative position which its blade-carrying portion is substantially parallel to the track to an inoperative positon in which said blade-carrying portion is at an angle to the track, said blades and scraper lie above a plane containing the lowermost surfaces of said runners and said lateral guides.

4,014,117

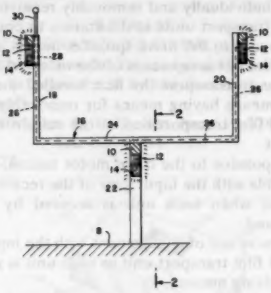
SPECTATOR FOOTBALL VISUAL AID

Robert G. Vallillee, 87 Glynn Ave., Ottawa, Ontario, Canada (K1K 1S7)

Filed Aug. 21, 1975, Ser. No. 606,578

Int. Cl.² A63B *71/00*; G09F *19/00*

U.S. Cl. 40—125 J **2 Claims**



1. Football play status indicating apparatus responsive to a remote control radio signal, said apparatus comprising: a pair of portable first down measuring sticks; an electrical cable of a predetermined length being the only means interconnecting said sticks for enabling said sticks to define a predetermined distance when said sticks are spaced apart a distance for maintaining said cable taught therebetween; a pair of lamp means respectively carried on said pair of sticks for indicating the status of play; said pair of lamp means being electrically interconnected via said cable; radio receiver means, switch means and battery means carried by one of said sticks; said switch means being electrically interposed between said battery means and said pair of lamp means and being controlled by an output of said receiver means for selectively electrically coupling said battery means to said pair of lamp means in response to receipt of said remote control radio signal by said receiver means.

4,014,118

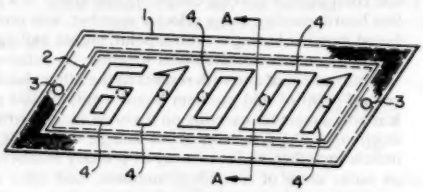
INTERCHANGEABLE SIGN

Jules P. Robinet, 2865 Virginia Park, and John Tamasovics, 2530 Todd Lane, both of Windsor, Ontario, Canada

Filed May 12, 1975, Ser. No. 576,667

Int. Cl.² G09F *7/06*

U.S. Cl. 40—143 **5 Claims**



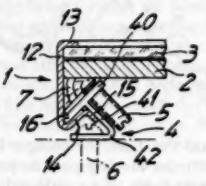
1. A sign made of plastic material and having replaceable and interchangeable components, comprising in combination a planar light reflecting frame which is provided with a plurality of holes for attaching said sign to a wall, and grooved interior rims on both sides of the frame so as to define front and rear cavities there within; a background panel to matingly press fit into said grooved rims of the frame, said panel being provided with a plurality of equally spaced apertures, located along the horizontal or vertical centerline of said panel, each aperture containing a readily severable thin film therein of the same plastic material as that of the panel; and various numbers, letters, or symbols which can be removably attached to

said panel to form single or multiple numbers or words, said letters or numbers each being provided with a central cylindrical pin within a corrugated cavity in the rear thereof, said pin being sized to matingly engage as by being press fitted into said panel apertures for attaching said letters or numbers to one of said panels after mating within said front cavity of the frame.

4,014,119
VARIABLE FRAME FOR THE RECEPTION OF NATURALLY STIFF DISPLAY ARTICLES

Karl Heinz Teufel, Stergweg 4, 79 Ulm, Germany

Filed Jan. 8, 1976, Ser. No. 647,304
Claims priority, application Germany, May 28, 1975, 2523557
Int. Cl.² G09F 1/12
U.S. Cl. 40—152 6 Claims

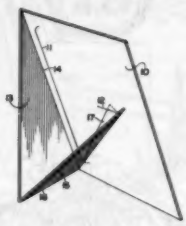


1. Apparatus for framing and displaying one or more sheets comprising in combination: at least one sheet having lateral edges, a generally U-shaped member for placement over at least one of the edges, the member having a center section and a pair of spaced-apart legs protruding from the center section, the spacing between the legs being greater than the thickness of the sheet so that sheets of varying thicknesses can be received in the U-shaped member, one of the legs depending at an acute angle from the center section towards the other one of the legs and having itself an L-shaped cross-section so that said one leg ends in a protrusion extending away from a remainder of said one leg and of the center section, the U-shaped member further including a longitudinally extending rib protruding from the center section, spaced from and extending towards said one leg; a tightening bar having a triangular cross-section and defining a pair of perpendicular sides and an angularly inclined side joining the perpendicular sides, the perpendicular sides engaging the sheet and the center section, respectively, so that the angularly inclined side faces said one leg of the U-shaped member, the perpendicular side engaging the center section being further disposed between the sheet and the rib; and clamping means for applying a force to the tightening bar for moving the bar parallel to the center section towards and into engagement with the sheet so that the sheet is clamped between the bar and said other one leg of the U-shaped member, the clamping means being defined by a clamp having a generally T-shaped cross-section in engagement with said one leg and the rib, a bolt threadably engaging the clamp and positioned to engage the tightening bar so that the bolt can be threaded against the bar for applying said force, the clamp further including an arm extending at an angle from a remainder of a bar and positioned to be generally parallel to the other leg of the U-shaped member, the arm including means for securing the arm and therewith the clamp, the U-shaped member and the sheet to an upright support wall.

4,014,120
PICTURE MOUNT AND SUPPORT

David S. Merz, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 8, 1974, Ser. No. 522,141
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 3 Claims



1. An easel backed frame for displaying and supporting a photograph or the like comprising:

a. a rectangular frame comprising a panel which is centrally apertured to provide a window through which a photograph or the like placed behind said panel may be seen;

b. an easel back comprising:

i. a rectangular first substantially planar member having a perimeter coextensive with said frame and attached to said frame;

ii. a first slit in said first planar member parallel to a first edge thereof and extending approximately ninety percent of the distance between the edges thereof forming said first edge;

iii. a second slit in said first planar member said second slit comprising two obliquely intersecting slashes, the first of said two slashes being generally perpendicular to, but not intersecting said first slit, the intersection of said two slashes being approximately two-thirds of the prependicular distance from said first edge of said first planar member;

iv. a triangular second planar member, one edge of which is hinged to and coextensive with said first edge of said first planar member;

v. a triangular third planar member, one edge of which is hinged to and coextensive with one edge of said second planar member other than its edge which is coextensive with said first edge of said first planar member; and

vi. a fourth planar member, one edge of which is hinged to and common with a part of one edge of said third planar member other than its edge which is common with said second planar member, a portion of which is engageable with said second slit thereby forming a rigid structure capable of supporting a picture frame.

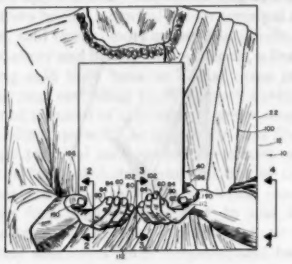
4,014,121
PHOTOGRAPH HOLDER

Robert D. Moser, 115 Aztek, Council Bluffs, Iowa 51501

Filed Aug. 29, 1974, Ser. No. 501,596
Int. Cl.² G09F 1/10
U.S. Cl. 40—158 R 9 Claims

1. A card holder comprising a base sheet of material having a forward side having a card-receiving area for receiving thereagainst a card having planar forward and rearward sides, right and left tab means sections disposed on said forward side of said base sheet, said tab means sections having inner and outer ends, each of said inner ends being further from a respective certain edge of said sheet than the outer end of the same tab means section, said tab means sections each having its said outer end attached to said base sheet and each tab means section being separate from said base sheet except at said attached outer end thereof whereby a card can be inserted between said tab means sections and said base sheet,

said tab means sections being horizontally spaced apart when said base sheet is held in vertical position, said tab means being of one piece of material with said sheet, said base sheet having a visible coating thereon on its forward side, said coating illustrating at least a portion of the figure of a human being



and each of said tab means sections having a portion of said coating thereon illustrating portions of the fingers of said human being, said respective certain edge being the closest edge of said sheet along a line extending from the said inner end of a respective tab means section to its said outer end.

4,014,122

PAPERWEIGHT WITH SCREW THREADED BOTTOM CAP

Oscar J. Woods, 595 S. Mill Road, Vineland, N.J. 08360

Filed Sept. 22, 1975, Ser. No. 615,469
Int. Cl.² B43M *9/00*
U.S. Cl. 40—358 **2 Claims**

1. A paperweight device having a heavy, round in circumference, flat topped, transparent upper portion, a separable lower portion with means for securing the two portions together, the means for securing the two portions together are screw threads of 3/64 inch radius and 6 per inch, the separable lower portion is a standard production 63 millimeter G.C.M.I. thread cap, the upper outer side of the transparent upper portion have a 5° taper from the vertical towards the center of the portion and the upper edge having a corner of ⅛ inch radius, together with a display photo between the transparent upper portion and the lower cap, and cushioning means between the display photo and the lower cap to eliminate air space and distortion of the photo image from the top of the device when the cap is firmly screwed onto the transparent upper portion.

4,014,123

FIREARM SAFETY DEVICE

Coral C. Williams, 714 W. Lowden St., Fort Worth, Tex. 76110

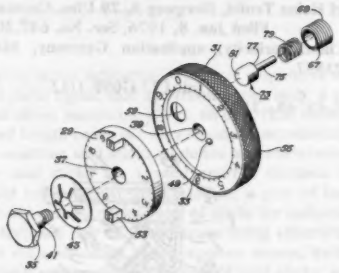
Filed Sept. 17, 1975, Ser. No. 614,348
Int. Cl.² F41C *17/08, 27/00*
U.S. Cl. 42—1 LP **9 Claims**

1. A safety device for a firearm having a firing mechanism incorporating a moving part enclosed by a casing, comprising:

a first dial, rotatably attached to the casing, having an aperture located a selected radial distance from the center;

a second dial, rotatably attached to the casing, concentric with and over the first dial, having a pocket at its inner side located at the same radial distance from the center as the aperture in the first dial;

a plunger mounted within the casing at the same radial distance from the center as the aperture in the first dial and adjacent the moving part of the firing mechanism; the plunger being axially movable and spring biased in a



direction toward the dials; the plunger having a portion engageable with the moving part to prevent its movement; the plunger being of a configuration to be closely received in the aperture and pocket; and

means for depressing the plunger axially within the casing into engagement with the moving part;

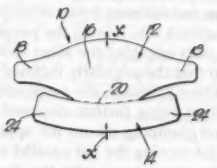
whereby the firearm is fireable only when the first and second dials are rotated such that the aperture and pocket are in alignment with the plunger, allowing it to spring axially away from the moving part.

4,014,124

SAFETY MARKER FOR FIREARM

E. Ernest Oberst, Cheshire, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.

Filed June 10, 1976, Ser. No. 694,590
Int. Cl.² F41C *27/10*
U.S. Cl. 42—1 Y **2 Claims**



1. A safety marker for a firearm with a trigger and a trigger guard, comprising a substantially flat and resiliently flexible shield having an elongated body part of an outline similar to that of human lips, and a rest part, of which said body part defines a center field with opposite sides and a bottom between said sides, and opposite arms continuous with and extending outwardly from said sides of the center field, and said rest part is continuous with said center field and depends from said bottom thereof, with said body part being of sufficient length to permit its distortion in resilient U-flexure for its

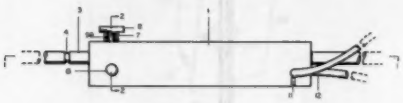
extension into and retention in a trigger guard with its arms on opposite sides of the trigger therein.

4,014,125

RESILIENT BAND-POWERED FISH AND ANIMAL SPEAR

Daniel G. Baldi, 36 Crestfield Drive, Brockton, Mass. 02402, and James A. Baldi, 120 Sumner St., Newton Centre, Mass. 02159

Filed July 31, 1975, Ser. No. 600,883
Int. Cl.² A01K *81/04*
U.S. Cl. 43—6 **1 Claim**



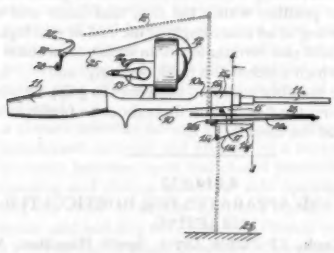
1. A device for spearing fish or animals that is easily manipulated with one hand in water, on the surface of water, or on land, said spearing device comprising, in combination, (1) a handgrip having a bore running lengthwise through it; (2) a spear shaft having a groove around it, slidably mounted in the bore running lengthwise through the handgrip; (3) a locking blade which moves up and down, entering and exiting the bore in the handgrip through a slot in the lower wall of said bore; (4) a trigger button attached to the locking blade by vertically moving side members; (5) a coil spring mounted under the trigger button; (6) a hole transversing the handgrip under the bore; (7) a resilient band formed into a loop attached to the spear shaft by any one of many existing ways, the resilient band being stretched and narrowed so as to snap into the hole transversing the handgrip under the bore so that, as the spear shaft is moved backward in the bore running lengthwise through the handgrip, the resilient band is stretched tight until the groove around the spear shaft passes over the locking blade which is pulled upward as the coil spring expands under the trigger button attached to the locking blade by vertically moving side members, causing the locking blade to lock and preventing the spear shaft from being fired until the trigger button is depressed, forcing the locking blade out of the groove around the spear shaft so that, as the resilient band contracts, the spear shaft is thrust forward.

4,014,126

SLINGSHOT-ACTION FISHING ROD

Wiley H. Samuels, Chicago, and James M. Murray, Oak Lawn, both of Ill., assignors to Wiley H. Samuels, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,632
Int. Cl.² A01K *91/02*
U.S. Cl. 43—19 **10 Claims**



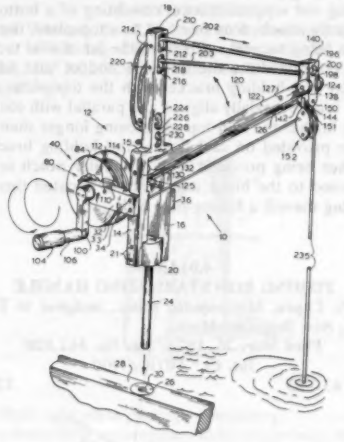
1. A slingshot casting attachment for a fishing rod comprising a frame attachable to the rod, a sling with which a fishing line is engageable, a sling coupling receiving the ends of the sling and mounted in the frame to lie close alongside the rod, such coupling movable to a raised position disposing the sling operatively, and means carried by the frame to lock the coupling when moved to said position.

4,014,127

FISHING APPARATUS

Lenord H. Turner, 387 3rd St. North, Cocoa, Fla. 32931

Filed June 9, 1975, Ser. No. 585,196
Int. Cl.² A01K *97/10*
U.S. Cl. 43—27.4 **15 Claims**



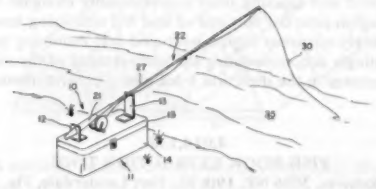
1. A fishing apparatus comprising, in combination:
a frame;
reel means rotatably attached to said frame;
means for rotating said reel means;
an extending member pivotally attached to said frame;
line guide means coupled to said extending member;
elastic restraining means attached to said frame and to said extending member for providing a restoring force in response to rotation of said extending member relative to said frame, whereby said extending member smooths transient tension variations which occur when a fishing line is reeled or secured through said line guide means onto said reel means; and
elastic restraining guide means rotatably attached to said frame for increasing the effective length of said elastic restraining means by movably folding said elastic restraining means thereover.

4,014,128

COMBINATION FISHING POLE HOLDER AND TACKLE BOX

Theodore Frederick Hrdlicka, 6486 S. Crocker, Littleton, Colo. 80120

Filed June 25, 1976, Ser. No. 700,058
Int. Cl.² A01K *97/10*
U.S. Cl. 43—21.2 **3 Claims**



1. A combination fishing pole holder and tackle box comprising, in combination:
a conventional tackle box; and

a fishing rod holding bracket consisting of a rectangular bottom plate attached on one end by means of a hinge to one end of a top plate, the bottom plate secured to the lid of said tackle box in any conventional way, with said fishing rod holding bracket disposed toward one end of said lid with its hinged portion positioned parallel to a narrow side or width of said lid, with said top plate being further provided with a round through hole with an inside diameter large enough to rest therein the handle portion of a fishing pole; and

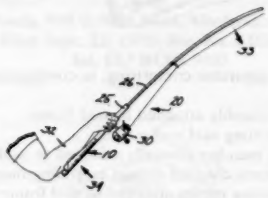
a fishing rod support bracket consisting of a bottom plate hingedly attached on one end to a top plate, the bottom plate being securely affixed to the lid of said tackle box and positioned on the opposite end of said lid as the fishing rod holding bracket with the top plates of both said brackets axially aligned and parallel with each other, with further the said top plate being longer than the top plate provided on said fishing rod holding bracket and further being provided with a circular notch in its end opposed to the hinge and centrally located thereon for resting therein a fishing pole rod.

4,014,129

FISHING ROD STABILIZING HANDLE

Gerald N. Capra, Minneapolis, Minn., assignor to Theodore Capra, New Brighton, Minn.

Filed Mar. 26, 1975, Ser. No. 562,020
Int. Cl.² A01K *87/00*
U.S. Cl. 43—23 **22 Claims**



1. In combination with a spinning-type fishing rod having an elongate flexible rod portion, a forward hand gripping portion coaxial with and adjacent one end of said flexible rod portion, and a reel mounting portion coaxial with and adjacent said forward hand gripping portion for mounting a fishing reel in underslung manner thereto, a posterior rod stabilizing handle rearwardly continuously extending from said reel mounting portion and characterized by a broad upwardly directed elongate surface for alignment with and direct engagement of a substantial length of the underside of the forearm portion of that arm of a fisherman which operatively grasps said fishing rod at said forward hand gripping portion to provide stabilizing forces to said fishing rod which forces are distributed along the length of said posterior rod stabilizing handle to counterbalance opposing forces transmitted through said rod when landing a fish or reeling in an object, said elongate upper surface being disposed relative said rod so as to lie in a generally horizontal plane when said rod is horizontally operatively positioned and tapering from a substantially elongate broadened region near the butt end of said rod stabilizing handle to a relatively narrower region near said reel mounting portion for matingly accommodating the natural taper of the width of said forearm in the direction from elbow to wrist thereof.

4,014,130

FISH HOOK EXTRACTION TOOL

Allen Roberts, 3006 NE. 19th St., Fort Lauderdale, Fla. 33305

Filed Feb. 20, 1976, Ser. No. 659,669
Int. Cl.² A01K *97/00*
U.S. Cl. 43—53.5 **1 Claim**

1. A fish hook extraction tool comprising: a pipe having a generaly conical flare at one end; plural nothces spaced about the periphery of said flare for engaging a fish hook; a longitudinally directed slot in said pipe communicating with said flare

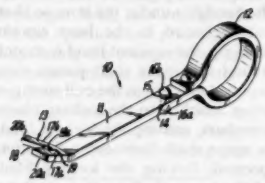
for guiding said tool along a fishing line; the opposite end of said tool being bent to form a handle; and diametrically opposed notch means in said opposite end for secruely engaging said fishing line.

4,014,131

FISH HOOK EXTRACTOR

John Bendik, 2821 Schurz Ave., Bronx, N.Y. 10456

Filed Mar. 23, 1976, Ser. No. 669,693
Int. Cl.² A01K *97/00*
U.S. Cl. 43—53.5 **4 Claims**



1. A fish hook extractor comprising:

an elongated member having a gripping means at one end and means for grasping the fishing hook at the other end thereof, siad latter means being positioned at an angle to the plane of the elongated member and including at the other end thereof a slotted portion comprising a pair of legs each having tapered outer faces to facilitate entry of the extractor into a fish and tapered inner faces forming a slot of decreasing width therebetween to guide the fish hook into position within the slot, said outer and inner faces meeting at an acute angle at the end of said legs, and wherein said slot terminates in an enlarged arcuate base portion which catches the hook secruely, and

a transverse member mounted adjacent the gripping portion for securing the fishing line thereabout to facilitate withdrawing of the hook.

4,014,132

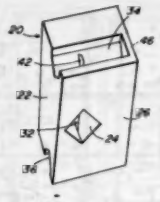
METHOD AND APPARATUS FOR HORTICULTURAL GRAFTING

Edward J. Cook, 12 Patton Drive, South Hamilton, Mass. 01982

Filed Jan. 29, 1976, Ser. No. 653,465
Int. Cl.² A01G *1/06*
U.S. Cl. 47—6 **11 Claims**

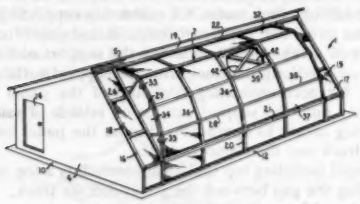
1. A device for cutting away sectors from the facing ends of plant comonents to be grafted one to the other, comprising

a. a body of rigid construction,
b. said body being formed with a socket in one face thereof,
c. a slitter mounted to said body and through said socket,
d. the plane of said slitter disposed substantially along the longitudinal axis of said socket for making longitudinal slits at least twice the component diameter in components inserted therein,



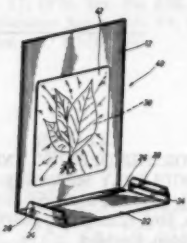
e. at least one channel formed along another face of said body in a direction perpendicular to the length of said socket and the plane of said slitter,
f. one end of said slitter extending into said channel for severing sectors of slit components applied thereto.

4,014,133
GREENHOUSE STRUCTURE
Howard P. Brown, 104 S. Nash St., Starkville, Miss. 39759
Filed Apr. 14, 1975, Ser. No. 567,744
Int. Cl.² A01G *9/00*
U.S. Cl. 47—17 **6 Claims**



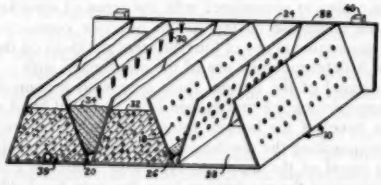
1. A greenhouse structure for growing plants and comprising:
a. a building structure having a rear wall and opposite end walls and roof means cooperating with said rear wall and said opposite end walls to define an enclosed space having a front side with an inclined portion and an upright portion, said front side inclined portion having end portions cooperating with said roof means and said upright portion of said front side to define an opening therebetween in said inclined portion of said front side, said front side upright portion having end portions, said upright portion of said building structure front side including a removable center portion extending between said end portions of said front upright portion and having the major area of said center portion formed of translucent material;
b. a closure member having a major area thereof formed of translucent material and pivoted on a horizontal axis and movable between open and closed positions respectively opening and closing said front side opening for controlling the entry of natural light and outside air for plants inside said building structure, said closure member having a cross sectional shape generally of a cylindrical segment;
c. an earth floor within said building structure for growing plants;
d. a plurality of translucent panels in said end portions of said front side inclined portion to permit sunlight to pass therethrough for substantially full utilization of the earth floor for growing plants;
e. temperature responsive control means within said building structure; and
f. drive means operatively connected to said closure member and controlled by said temperature responsive control means for moving said closure member between said open and closed positions in response to temperature changes within said building structure.

4,014,134
PLANT PACKAGE
W. Victor Womack, Jr., P.O. Box 19091, Houston, Tex. 77024
Filed Aug. 27, 1975, Ser. No. 608,185
Int. Cl.² A01G *5/00, 13/00;* **B65D** *85/52, 25/54*
U.S. Cl. 47—84 **24 Claims**



1. A fluid tight plant package comprising:
a. a substantially rectangular, fluid impervious base panel having a width dimension;
b. a front panel substantially smaller in height than said base panel, said front panel being defined by a first portion of said base panel folded over along said width dimension, said front panel and a portion of said base panel defining a four-sided pocket which is closed along three sides and open along a fourth side; and
c. a transparent member attached only to a second portion, other than said first portion of said base panel, in a fluid tight relationship to define a plant-receiving chamber having upper and lower regions, said front panel extending in front of a portion of said transparent member to thereby place said lower region within said pocket, wherein said smaller front panel defines a protector for said lower region, and said upper region provides unimpeded observation of a portion of a plant in said plant-receiving chamber.

4,014,135
MODULAR CHANNEL CULTURE DEVICE
George Greenbaum, 790 Boylston St., Boston, Mass. 02199
Filed May 7, 1976, Ser. No. 684,465
Int. Cl.² A01G *9/02*
U.S. Cl. 47—86 **19 Claims**



1. A modular channel culture device comprising, in combination:
a plurality of modules each comprising a horizontal base wall of rectangular form and a pair of side walls joining opposite lateral edges of said base wall, projecting upwardly therefrom, and being inclined toward one another

to define an opening therebetween above said base wall and narrower than said base wall, said base and side walls defining a channel of trapezoidal cross section extending parallel to said lateral edges through said module, said side walls being formed with a plurality of perforations; said modules being arranged in parallel rows, the modules in each row being aligned in end-to- end abutting relation to extend said trapezoidal -section channel continuously through the length of the row, said rows abutting one another laterally to define of adjacent rows, said trapezoidal and V-section channels each being adapted to contain plant-supporting medium, and said perforations connecting said trapezoidal and V-section channels in fluid-row communication.

4,014,136

MEANS FOR THE OPENING AND CLOSING OF ANGULARLY MOVABLE PANELS

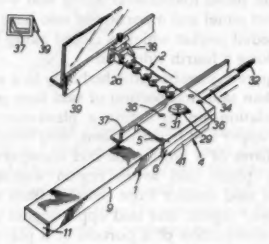
James Frederick Hemens, Billericay, and Alan John Eastty, Shoeburyness, both of England, assignors to Teleflex Morse Limited, Basildon, England

Filed July 10, 1975, Ser. No. 594,919

Claims priority, application United Kingdom, July 18, 1974, 31961/74; Mar. 7, 1975, 9675/75

Int. Cl.² E05F *11/03*

U.S. Cl. 49—325 **19 Claims**



1. A mechanism for opening and closing an angularly movable panel, comprising a drive box for attachment to a fixed frame, the drive box housing a cable wheel rotatable upon translation of a control cable when in operative association therewith, a chaincase having a sprocket operatively connected with a chain located in a casing, the chain being for attachment at one end to an angularly movable panel, rotation of the sprocket effecting translation of the chain into, or out of, the casing in accordance with the sense of sprocket rotation, the chaincase having similar opposite connections for being mountable in any of four different positions on the drive box as is determined by use of the mecahnism with

a. a panel of the bottom hung type with a control cable approaching the mechanism from the right hand side,

b. a panel of the bottom hung type with a control cable approaching the mechanism from the left hand side,

c. a panel of the top hung type with a control cable approaching the mechanism from the right hand side,

d. a panel of the top hung type with a control cable approaching the mechanism from the left hand side

and in each of these positions having its sprocket in drivable communication with the cable wheel without the necessity of disassembling the chaincase and reorienting the positions of the sprocket and chain.

4,014,137

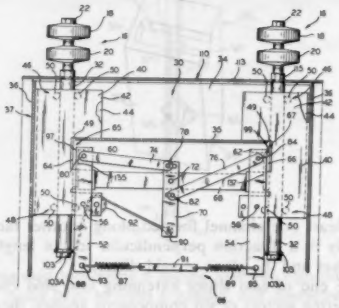
DROP ACTION PANEL ARRANGEMENT FOR OPERABLE PARTITIONS

Charles E. Williams, Delavan, Wis., assignor to Hough Manufacturing Corporation, Janesville, Wis.

Filed Mar. 8, 1976, Ser. No. 664,440

Int. Cl.² E06B *7/28*

U.S. Cl. 49—321 **13 Claims**



1. In an operable panel type partition arrangement including a plurality of discrete panel units an overhead tract defining the path of movement of the panel units over a support surface, and a pair of carriers for each panel unit riding on the track for movement of the respective panel units along the track, the improvement wherein said panel units each comprise:

a panel vertically movable relative to the panel unit carriers, said panel including means for releasably supporting same on the panel unit carriers to suspend said panel from the track in a raised position above the support surface for movement along the track over the support surface,

means for accommodating dropping of the panel under gravity onto the support surface on release of said supporting means to operatively dispose the panel between the track and the support surface,

said panel including top seal means including a top seal for closing the gap between the panel and the track,

said releasable supporting means comprising:

each of said carriers of said panel carrying a detent in fixed relation thereto,

said panel having adjacent each carrier a catch arm mounted on the panel for movement into engagement with the detent adjacent same for supporting the panel therefrom in said panel raised position,

and means for moving said catch arms out of engagement with the respective detents to effect release of said supporting means.

4,014,138

ANTI-RACK MEANS FOR DOORS

Clarence E. White, Kenosha, Wis., assignor to White Welding & Mfg. Inc., Kenosha, Wis.

Filed Apr. 7, 1975, Ser. No. 565,750

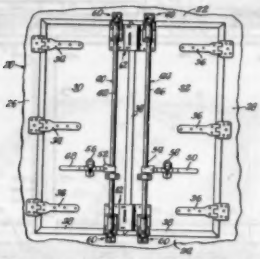
Int. Cl.² E05C *7/02*

U.S. Cl. 49—367 **2 Claims**

1. In an anti-racking means for use with a door frame, a pair of doors vertically hinged to the frame and presenting free edges which are adjacently located when the doors are in closed position, and rotary bar door locking mechanism, said anti-racking means comprising a first bracket having a base portion secured to one of the doors and having a side portion adjacent the free edge of the door, a second bracket having a base portion secured to the other door and having a side portion adjacent the free edge of the door, said side portions of said brackets being provided with interengageable means,

said side portions of said brackets being disposed in overlapping relationship when the doors are in closed position, and said interengageable means being interengaged when the doors are in closed position for reinforcing the doors and the door frame, the improvement comprising:

said side portion of said first bracket being formed with a vertically oriented tongue, and a pair of vertically spaced



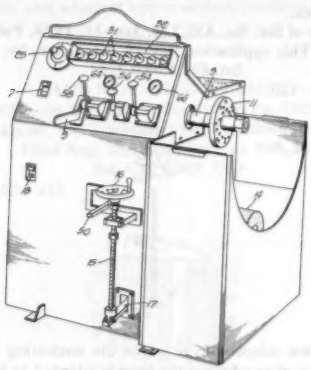
horizontally oriented projections, extending perpendicular to the plane of the one door; said side portion of said second bracket being formed with a vertically oriented aperture; and said tongue of said first bracket being interengaged with said aperture of said second bracket, said side portion of said second bracket being interengaged with said projections of said first bracket, when the doors are in closed position.

4,014,139

WHEEL BALANCE AND TRUING MACHINE

Donald H. Shooter, and Otto F. Colbert, both of 7913 Chatfield Ave., Whittier, Calif. 90605

Division of Ser. No. 432,461, Jan. 11, 1974, Pat. No. 3,911,751. This application Sept. 11, 1975, Ser. No. 612,357
Int. Cl.² B24B *5/00*
U.S. Cl. 51—5 R **6 Claims**



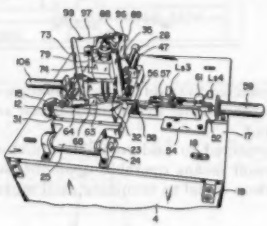
1. A wheel balance machine for testing a tire/wheel combination for dynamic and statis unbalances, said machine including: a frame; a drive shaft; a first bearing rotatably mounted one end of said drive shaft to said frame; a drive motor; means coupling said drive motor to said drive shaft; a hub mounted at said one end of said drive shaft adjacent said first bearing for supporting a tire/wheel combination for rotation by said shaft about the axis of rotation of said shaft; a second bearing rotatably mounting the other end of said shaft to said frame; control means coupled to said second bearing for causing said second bearing to maintain the other end of said shaft on the axis of rotation thereof for one condition of said contol means, and said control means being adjustable to a second condition for causing said second bearing to permit radial deflection of said other end of said shaft upon rotation of said shaft in the presence of dynamic unbalance of said tire/wheel combination; indicating means mounted at said other end of said shaft for indicating the angular position of said shaft at which such radial deflection occurs; an abrasive wheel rotatably mounted on said frame; a second drive motor coupled to said abrasive wheel to impart rotational motion to said abrasive wheel; and adjustable means coupled to said abrasive wheel for moving said abrasive wheel towards and away from the periphery of the tire/wheel combination mounted on said hub.

4,014,140

HIGH-PRECISION CHAMFERRING APPARATUS

Sueo Aoki, and Nobumasa Amamoto, both of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Feb. 17, 1976, Ser. No. 658,521
Claims priority, application Japan, Feb. 19, 1975, 50-19877
Int. Cl.² B24B *7/00*
U.S. Cl. 51—109 R **3 Claims**



1. An apparatus for chamferring edges and corners of a rectangular article such as a throw-away tip with high precision comprising:

grinding wheel means for chamferring a blank;

guide means adjacent to said grinding wheel means;

feeder means for transferring the blank along the guide means under chamferring of one edge of the blank;

turning means for changing the orientation of the blank under chamferring of one corner of the blank; and

discharge means for discharging the chamferred blank out of the apparatus.

4,014,141

APPARATUS AND METHOD FOR CONTROLLING MAGNETIC HEAD SURFACE FORMATION

Stanley T. Riddle, and Gary G. Vair, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

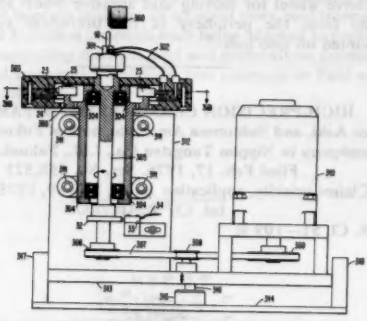
Continuation of Ser. No. 450,137, March 11, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,843
Int. Cl.² B24B *49/00*
U.S. Cl. 51—165 R **4 Claims**

1. A system for controlling the formation of the surface contour of a multi-lead magnetic single-track head element having a portion, removed during surface formation, which has an electrical characteristic monitorable through said leads, wherein there are provided: a rotatable armature for fixedly retaining and continuously rotating the magnetic head about an axis passing through the surface contour, an abrasive material, relative motion between the armature and the abrasive material along the axis of the rotation of the armature bringing the head surface into contact with the abrasive material; and a stationary resistance detector, electrically connected to the rotatable magnetic head, for detecting the electrical characteristic of aforesaid head in terms of resistance; the invention being characterized by:

a counter connected to the rotating armature for counting the number of rotations of the head and supplying a count signal upon the occurrence of a predetermined count;

means indicating a predetermined desired limit resistance amount;

comparison means, associated with the indicating means, resistance detector and counter operable upon the occurrence of said count signal to generate a comparision signal if the detected resistance equals or exceeds the limit resistance amount;



means connected to said rotatable armature operable by an external start signal to initiate rotation and axial movement; and

means connected to said rotatable armature and to said comparison means operable upon the occurrence of a comparison signal to terminate axial movement.

4,014,142

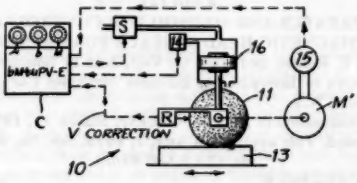
METHOD AND APPARATUS FOR GRINDING AT A CONSTANT METAL REMOVAL RATE

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jan. 16, 1974, Ser. No. 433,890

Int. Cl.² B24B *49/00*

U.S. Cl. 51—165.77 **3 Claims**



1. A method of grinding at constant metal removal rate comprising determining the difference between the power, E, drawn by the grinding wheel as indicated by a wattmeter, and the power required by a selected metal removal rate M for any wheel calculated as a function of the normal force between the wheel and the work, P, increasing the force, P, on the grinding wheel when the indicated power is less than the calculated power, and decreasing the force, P, on the grinding wheel when the indicated power is more than the calculated power, wherein the instantaneous values of normal force and power are observed on the EP plane in an oscilloscope, and the vertical force is adjusted manually whereby the point representing the instantaneous values of E and P falls on a predetermined straight line representing E as a function of P for a predetermined fixed metal removal rate for wheels of varying grinding grade.

4,014,143

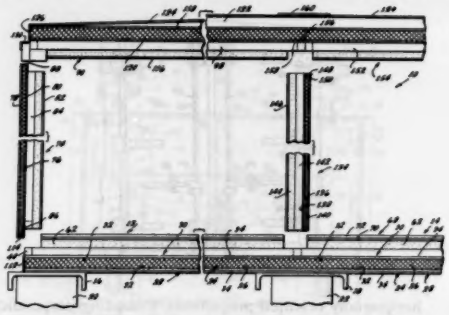
BUILDING STRUCTURAL SYSTEM

Kenneth G. Purcell, 807 S. Catalina Ave., Redondo Beach, Calif. 90277

Filed Apr. 23, 1976, Ser. No. 679,562

Int. Cl.² E04B *7/02*

U.S. Cl. 52—90 **10 Claims**



1. A building panel construction comprising:

a laminated member including a pair of skins each having an outer surface and an inner surface, and a core of honeycomb material bonded to said inner surfaces of said skins, said laminated member having a pair of sides and a pair of ends;

a rectangular frame affixed to said laminated member along a perimeter defined by said sides and said ends; and

fasteners affixed to said frame for connecting the frames of abutting panels together.

4,014,144

ADAPTOR FOR CONVERTING AN L-SHAPED ROD INTO AN EARTH ANCHOR

Jack D. Gale, Crowley, Tex., assignor to Clare P. Tubbs, Richardson, Tex.

Division of Ser. No. 435,224, Jan. 21, 1974, Pat. No. 3,896,890. This application July 28, 1975, Ser. No. 599,763

Int. Cl.² E04D *5/80*

U.S. Cl. 52—157 **3 Claims**

2. A device adapted to serve as the anchoring base of a screw-type anchor wherein the base is adapted to be embedded in the earth with a rod extending from the base to the earth's surface, comprising:

a. a generally helical-shaped flight having a length which includes at least one full turn;

b. an axial opening along the center of the flight, said opening having a diameter slightly larger than the diameter of the anchor rod; and

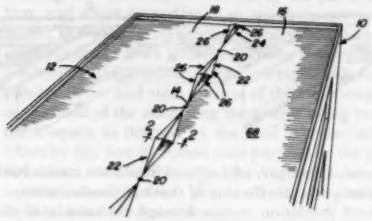
c. a generally horizontal collar permanently fixed to the flight and extending radially from the axial opening toward the periphery of the flight, with said collar terminating on its inner end at a location to receive the L-shaped foot of an anchor bolt, with at least a portion of the flight lying above the horizontal collar in a location to bear against the anchor bolt's shank and prevent rotation

of the foot within the collar, whereby the anchor bolt may be rigidly held so that its longitudinal axis coincides with the axis of the flight.

4,014,145
ROOF SADDLE

John L. Groves, 5260 N. Genesee Road, Flint, Mich. 48506

Filed Feb. 19, 1976, Ser. No. 659,550
Int. Cl.² E04D 13/40; E04B 7/00
U.S. Cl. 52—199 9 Claims

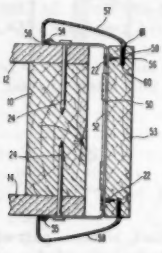


1. In combination, a roof structure including an upper surface, a plurality of upwardly opening drain openings spaced apart in a straight line extending along the roof, a roof saddle including at least one section of triangular plan shape including base, height and slant height edges with said base and height edges disposed at generally right angles relative to each other, a plurality of first constant thickness panels and second panels of tapering thickness positioned on said roof and disposed in superposed relation to define a generally planar upper surface inclined upwardly away from the upper surface of said roof structure toward the juncture between the base and height edges of said saddle, said height edge being disposed along said line and the apex of said height and slant height edges projecting toward and disposed adjacent one of said drain openings, and flexible roof sheeting secured over said saddle and adjacent upper surface portions of said roof.

4,014,146
JAMB MOUNTING ASSEMBLY

Paul S. DiMascio, R.D. No. 2, Boyertown, Pa. 19512, and John D. DiMascio, No. 2 Sylvan Drive, Pottstown, Pa. 19464

Filed Aug. 28, 1975, Ser. No. 608,443
Int. Cl.² E06B 1/02
U.S. Cl. 52—211 8 Claims



1. A jamb mounting assembly for securing a jamb in spaced relation to an edge member of a rough opening in a structure, comprising:

a slide plate including first and second legs disposed at substantially right angles to one another;

a jamb plate having first and second legs, said first leg comprising at least one raised element extending substantially transversely to said first leg and defining apertures at either side thereof for slidably receiving said second leg of said slide plate, said legs of said jamb plate being disposed at substantially right angles to one another;

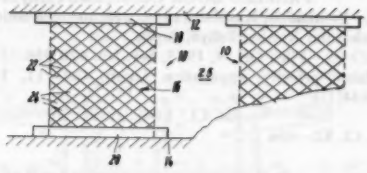
the distal ends of said second legs of said slide plate and jamb plate having a substantially semicircular bend so that the extremities thereof face toward a plane generally coextensive with said second legs to form a detent; and

an elongate molding adapted to extend over ones of said second legs and having an inwardly-turned lip thereof, said lip being substantially flat to extend substantially parallel to said second legs and being receivable beneath said detent means.

4,014,147
HEAT-INSULATING CONSTRUCTION ELEMENT FOR REINFORCING DOUBLE-WALLED PRESSURE TANKS

Ludwig Wesch, Goerrestr. 54, 6900 Heidelberg, Germany

Filed Mar. 31, 1976, Ser. No. 672,057
Claims priority, application France, Apr. 2, 1975, 75.10232
Int. Cl.² E04B 1/74
U.S. Cl. 52—249 9 Claims



8. A heat-insulating reservoir comprising a tank, an exterior, tank-enclosing structure, and means interposed between the outer wall of the tank and said structure for heat-insulating the two from each other and for securing the tank in place with respect to the outer wall, the tank and its enclosing structure having two spaced substantially parallel walls, a plurality of heat-insulating construction elements interposed between said two parallel walls to maintain them a predetermined distance apart, each of said construction elements having a perforated tubular wall formed of a winding of heat-insulating filamentary material reinforced by a cured resin, and an annular element forming an end abutment for the body attached to each end of the body, and a heat-insulating packing filling the space presented between the two substantially parallel walls and within the construction elements.

4,014,148
SEALING ELEMENT FOR CORRUGATED PANEL ASSEMBLIES

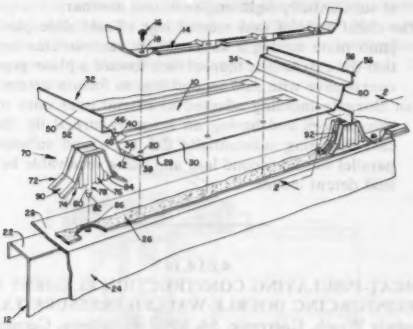
James W. Harter, Independence, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Dec. 17, 1975, Ser. No. 641,679
Int. Cl.² E04B 1/68
U.S. Cl. 52—403 8 Claims

1. A sealing element for use with corrugated roof panels to seal voids between the roof panels and a building structural member adjacent the ends of the panel corrugations, comprising:

a support member which approximately corresponds in shape and size to the transverse cross-sectional shape and size of one of the corrugation ends, which includes a plurality of reinforcing ribs integral therewith and an alignment element integral therewith for cooperation with alignment means in the building structural member to align said support member in the end of a panel corrugation so that said reinforcing ribs and said alignment element are oriented transversely of the corrugation; and

a flange element on said support member for engaging the



corrugation to close and seal the void between the roof panel and the corrugation end.

4,014,149

PANELED DOOR CONSTRUCTION

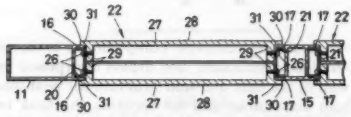
Yukio Yamamoto, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1975, Ser. No. 620,936

Claims priority, application Japan, Oct. 11, 1974, 49-123444[U]

Int. Cl.² E04C *2/38*

U.S. Cl. 52—456 **3 Claims**



1. A paneled door construction comprising:

a. a first pair of stiles having exposed outer surfaces;

b. top and bottom rails having exposed outer surfaces connecting said stiles together; and

c. a block assembly disposed between said stiles, said block assembly including,

1. A pair of inner stiles spaced apart horizontally from each other and extending vertically between said top and bottom rails, and disposed in and concealed by said first pair of exposed stiles,

2. alternate externally exposed blocks and exposed block-parting members sandwiched between and engaging said inner stiles, the periphery of each block overhanging said first exposed stiles and the adjacent block-parting members or rail, and

3. screws extending through said inner stiles into the blocks and the block-parting members.

4,014,150

INSULATION SYSTEM FOR BUILDING STRUCTURES

David Lee Wells, Adrian, Mich., and Ronald Buxton Raab, Perrysburg, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 19, 1975, Ser. No. 642,507

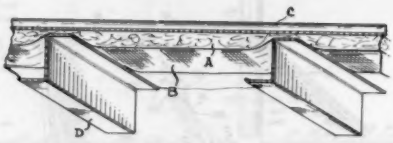
Int. Cl.² E04C *1/34*

U.S. Cl. 52—461 **7 Claims**

1. An insulation system for a building structure having structural members and a covering material spanning the exterior portions of said structural members, both having a relatively high coefficient of thermal conductance, comprising:

a. a first insulation means for isolating said covering material from said structural members, said first insulation means being located between said structural members and said covering material and said first insulation means having a relatively low coefficient of thermal conductance;

b. a second insulation means in the form of a board-like sheet or layer of material, said second insulation means having at least one edge resting on a portion of at least one of said structural members and at least almost spanning the distance between two adjacent structural members, an opposite edge being at least near an adjacent



structural member, said second insulation means having a relatively low coefficient of thermal conductance;

c. a third insulation means located between said second insulation means and said covering material, said third insulation means having a higher insulating value than said second insulation means; and

d. a fourth insulation means fastened to most or all of the structural members, said fourth insulation means being of a configuration and location to completely insulate the structural member to which it is fastened from the interior of said building.

4,014,151

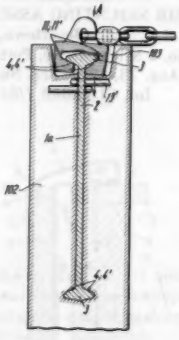
COUPLING STRUCTURE WITH ANCHORING IN STONE PARTS

Dieter Erhart, Memmingerberg, Germany, assignor to Mannesmann Leichtbau, GmbH, Munich, Germany

Continuation of Ser. No. 582,675, June 2, 1975, abandoned, and a continuation of Ser. No. 372,155, June 21, 1973, abandoned. This application June 1, 1976, Ser. No. 691,334

Int. Cl.² E04G *21/12*

U.S. Cl. 52—587 **11 Claims**



1. Coupling structure, wherein part of the coupling is an anchoring member being embedded in an artifical stone part such as a siding or a plate made of concrete or other stone material that permits embedding of anchoring members, comprising:

an anchoring member constructed as profiled section extending in a first direction and having similarly contoured cross-sections in planes transverse to the first direction, the member having a flat stem portion with flatness also extending in the first direction and longer than the stem portion is thick, the stem portion being partially embed-

ded in the stone part material and projecting above a flat surface portion of the stone part, the member having a head extending lengthwise in the first direction as well as laterally from the flat stem in a profiled contour in the said planes, the head having convex surface portion where laterally extending from the stem, the head being on a portion of the stem that projects above the said stone part surface;

a coupling member constructed as a profile bar with C-shaped cross-section and extending in a particular direction and having a base, a pair of side flanges having also lengthwise extension in the particular direction but extending from the base, transverse to the particular direction, and edges extending from the flanges towards each other, but leaving clearance space wider than the said stem portion is thick thereby defining a straight slot with predominant extension in the particular direction, for passage of the said stem portion of the anchoring member as the head of the anchoring member is being received by the C-space as defined by the base and the side flange, whereby the first direction runs parallel to the particular direction, each of the edges having a flat lower, outer surface extending from the slot to the respective flange from which the edge extends;

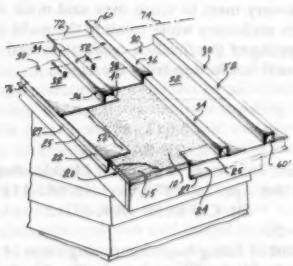
said coupling member as receiving the head being capable of limited angular displacement in said transverse planes and with a tilt axis parallel to said first and particular directions upon tilting one or the other of said edges abutting said stem laterally from one or the opposite side, limiting said angular displacement accordingly, the head of the anchoring member extending above the said stone part surface only, so that upon application of skewed pulling force upon the coupling member the lower outer surface portion of the one edge bearing against said flat surface portion of the stone material, as the one edge abuts the stem, while the lower outer surface of the edge which does not abut the stem, is raised above said surface portion; and

the edges having concavely shaped inner shoulders corresponding to the convex surface portion of the head and extending lengthwise in the particular direction, but for an angle larger than 90° from the respective flanges in a plane transverse to the particular direction, the said two concave shoulders being always respectively in engagement with the said convex surface portions of the head when the anchoring member is suspended from the coupling member, the head extending from the stone part so that the said lower edge surfaces clear the said surface portions of the stone part.

4,014,152
SHEET METAL ROOFING SYSTEM

Louis Léonce Vallee, 6392 Maubourg Ave., Montreal, Quebec, Canada H1M2C8

Filed Dec. 4, 1975, Ser. No. 637,597
Int. Cl.² E04D *1/00*
U.S. Cl. 52—588 **5 Claims**

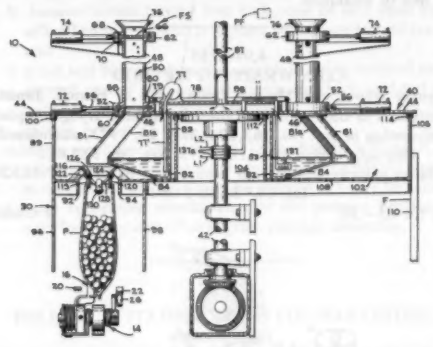


1. For use in a metal roofing system of the batten type, a series of pan sections, each formed of a simple piece of prefolded sheet metal having an elongated central region and two parallel upstanding side walls, a first of said upstanding side walls extending upwardly at right angles to the central region of the pan section and then outwardly in a plane parallel to the central region of the pan section, and the second of said upstanding side walls extending upwardly at right angles to said central region, outwardly parallel to said central region and then downwardly a distance short of the plane of the central region of the pan section to form a hollow partial rectangle and then folded back on itself to lie against the upwardly, outwardly and downwardly extended portions to form double walls of the second upstanding side wall, a terminal portion of the sheet metal forming the said second side wall being extended outwardly from the upwardly extending portion of the second side wall in the plane of the central region of the pan section beyond the downwardly extending portion of the second side wall to form a narrow margin to receive fasteners for holding the pan sections to an underlying roof structure.

4,014,153
FLUID DISPLACEMENT OF NONCONDENSIBLE GAS FROM VOIDS IN PRODUCTS

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 19, 1976, Ser. No. 650,345
Int. Cl.² B65B *31/02*
U.S. Cl. 53—21 FC **28 Claims**



17. A method of displacing a noncondensible gas from a particulate product in a degassing chamber and thereafter packaging the product comprising the steps of: moving a liquid through the product and through at least a portion of the degassing chamber to displace a noncondensible gas from the voids between particles of the product, precluding the reentry of noncondensible gases into said voids, draining the liquid from the product, and loading the product into a substantially air-free container.

4,014,154
PACKAGING METHOD AND APPARATUS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

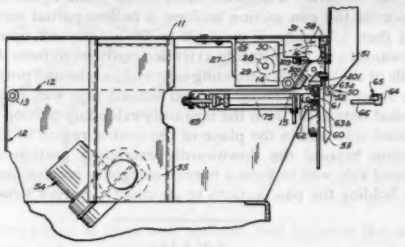
Division of Ser. No. 336,560, Feb. 28, 1973, Pat. No. 3,965,653, and a continuation-in-part of Ser. No. 139,453, May 3, 1971, Pat. No. 3,815,318. This application Apr. 23, 1975, Ser. No. 570,784
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.² B65B *5/00, 7/02, 43/36*
U.S. Cl. 53—29 **4 Claims**

1. A method of packaging comprising the steps of:

a. positioning a portion of a plastic web including a container to be sealed in a sealing station including a spaced pair of gripper bars and a heater bar therebetween;

b. isolating a part of the web to be sealed from external forces after the container has been loaded by bringing the gripper bars while in canted relationship into engagement with the web and clamping the web against the gripper bars;

c. effecting a heat seal in such isolated part while such portions are clamped against the gripper bars; and,



d. separating the container from the web while the web is clamped to isolate said part, such separation being effected along a line of weakness in the web outside such isolated part by moving the loaded container together with the heater bar and the gripper bars relative to the remainder of the web to exert separation forces along the line of weakness.

4,014,155

COIN WRAPPING METHOD

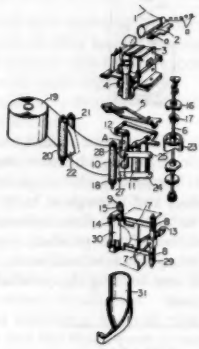
Tsuyoshi Izawa, and Masaru Itoda, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 363,104, May 23, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,011

Claims priority, application Japan, June 6, 1972, 47-56320

Int. Cl.² B65B *11/04*

U.S. Cl. 53—32 **1 Claim**



1. In a method for wrapping a coin-stack to form a coin-roll having end faces, wherein a coin-stack held between wrapping rolls adapted for holding and rotating the coin-stack is wrapped with a resinous sheet and projecting upper and lower lateral edges of the sheet are crimp-folded in over respective ends of the coin-stack to provide a coin-roll, the improvement comprising the steps of providing, as the wrapping sheet, a polyethylene sheet which is unidirectionally pre-drawn in a direction coinciding with the peripheral direction of the coin-stack and fed from a supply source to between the wrapping rolls and the coin-stack, holding the polyethylene sheet under tension during wrapping of the sheet about the coin-stack, wrapping the polyethylene sheet around the coin-stack so that the axial direction of the unidirectional drawing of the sheet is caused to coincide with the coin surface plane of the coin-stack, and effecting tucking of the projecting lateral edges of the sheet in a direction parallel to the axial direction of the unidirectional drawing of the sheet.

4,014,156

METHOD OF PRODUCING INDIVIDUALLY WRAPPED CONFECTIONS AND APPARATUS FOR PERFORMING THE SAME

Uwe Klahn, and Klaus Oberwelland, both of Halle, Westfalen, Germany, assignors to August Storck KG, Halle, Westfalen, Germany

Filed Feb. 24, 1975, Ser. No. 552,063

Claims priority, application Germany, Mar. 8, 1974, 2411093

Int. Cl.² B65B *11/34*

U.S. Cl. 53—34 **2 Claims**

1. In a method of continuously producing a series of confections by spinning flowable confectionery mass in a series of open top molds into which the mass has been introduced and to which rotation about a vertical axis is imparted by drive means for a limited period of time, the rotation being stopped when the mass has set in each mold and the confection then being removed from the mold, the improvement comprising:

providing said molds in series with a generally cupshape with the mouth of each mold constituting the widest portion of said mold;

inserting through the mouth of each said mold a wrapper material which will not tightly adhere to the confection to line the interior of said mold and form a partly finished single casing for a confection to be cast therewithin, the ends of the wrapper freely extending vertically through the mouth and above the height of the mold;

retaining said wrapper within the mold by vacuum pressure and without supporting the wrapper above the mouth of the mold;

casting a flowable confectionery mass into the upwardly open wrapper and permitting the flowable mass to become level;

rotating the mold to distribute the flowable confectionery mass over the bottom and sides of the wrapper and to thereby form a cavity within said confectionery mass;

completing the confection comprising at least providing said cavity in said confectionery mass with a filling;

gripping the edges of said wrapper together from above the confectionery mass to close over said mass and holding the edges stationary while rotating the mold to complete the wrapping of the finished confection; and

removing said confection from the mold.

4,014,157

TRASH BAGGER

Richard Elmer Pearce, 3410 N. 66th, Lincoln, Nebr. 68507

Filed Apr. 30, 1976, Ser. No. 682,111

Int. Cl.² B65B *1/04, 67/12*

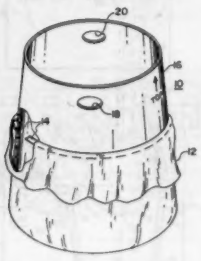
U.S. Cl. 53—35 **7 Claims**

1. A method of filling bags comprising steps of:

pulling the bag to be filled over a hollow bag holder having open bottom and top and at least one tapered side between the open bottom and top with the bottom of the

bag covering the open bottom and the open end of the bag circumscribing said side, the top being smaller than the bottom;

placing over the bag a retainer which contacts the bag and presses it against the bag holder at least at three points along the bag which are spaced sufficiently far apart so as to subtend at least 180° of an angle having its center at a point along the longitudinal axis of the bag holder;



folding the end of the bag over the retainer;

applying the materials to be packaged through the open top of the bag holder and permitting them to fall against the bottom of the bag;

pulling the retainer upwardly to remove it from the bag when the desired amount of material is already in the bag; and

pulling the bag holder upwardly to remove it from the bag.

4,014,158

APPARATUS FOR FILLING AND SEALING PREFORMED PACKAGING CONTAINERS UNDER ASEPTIC CONDITIONS

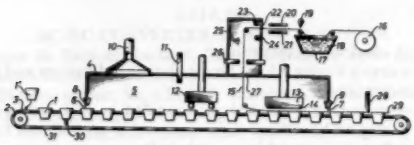
Hans A. Rausing, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden

Continuation of Ser. No. 495,285, Aug. 6, 1974. This application Jan. 5, 1976, Ser. No. 646,500

Claims priority, application Sweden, Aug. 24, 1973, 7311516

Int. Cl.² B65B *55/10, 55/18, 31/02*

U.S. Cl. 53—167 **1 Claim**



1. Apparatus for filling and closing packing containers under aseptic conditions comprising a movable conveyor belt for supporing a plurality of containers longitudinally thereof, a tunnel member having downwardly extending longitudinal side walls, the outer portions of said side walls being inwardly sloping, the longitudinal side edges of said conveyor belt bending angularly from the horizontal to engage the inwardly sloping outer portions of the longitudinal side walls of said tunnel member to constitute an outer wall of a chamber by forming a substantial seal with said tunnel member, means for maintaining a sterile atmosphere in said chamber, means within said sterile chamber for filling said containers and means within said sterile chamber for sealing said filled containers as they are moved through said sterile chamber.

4,014,159

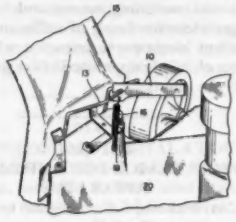
SPRING BRACKET FOR LAWN MOWER GRASS CATCHER

Charles J. Piazza, 6 Elizabeth Place, Wallington, N.J. 07057

Filed Mar. 17, 1976, Ser. No. 667,614

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **1 Claim**



1. A spring bracket for securing a lawn mower grass catcher assembly to the base of a lawn mower proper in which the catcher assembly includes a loop element extending as an integral part of said assembly, wherein spring bracket comprises:

a. a handle having a notch-like recess therein, said recess adapted for three-sided slide-fittable inclusion about said loop element;

b. tension means having two ends, one of said ends being affixed to said handle at a point proximate to said recess; and

c. a nut and bolt combination, said bolt being secured to the second end of said tension means in which said nut and bolt combination is itself secured to the base of the lawn mower proper,

wherein a rotational movement of the handle will result in a selectable decrease or increase in the force of said tension means which changes may be utilized in order to accomplish respective attachments of the present bracket to said loop element of said grass catcher assembly.

4,014,160

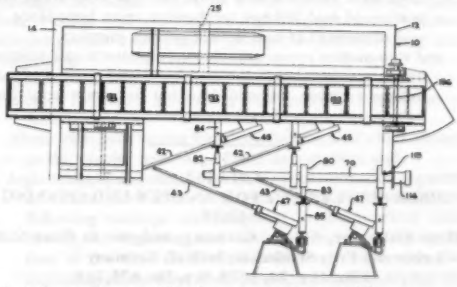
FOLIAGE AGITATING MEANS FOR HARVESTING MACHINES

Vito M. Mecca, North Collins, N.Y., assignor to Mecca Bros. Inc., North Collins, N.Y.

Filed May 8, 1975, Ser. No. 575,520

Int. Cl.² A01D *46/00*

U.S. Cl. 56—330 **9 Claims**



1. A harvesting machine for row crops comprising:

a. a frame movable along a row of plants in a manner straddling the row;

b. shaker means carried by said frame and including a plurality of elongated finger elements;

c. oscillating means carried by said frame for oscillating each of said finger elements about an axis generally perpendicular to the longitudinal axis of the finger element;

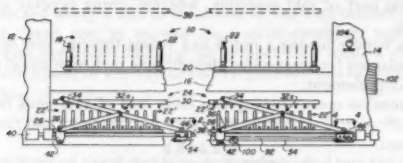
d. a corresponding plurality of connecting means for connecting each of said finger elements to said oscillating means, each of said connecting means comprising a hollow element of resilient material into which the corresponding finger element is fitted and a connector element fixed to said oscillating means and receiving said resilient element and said finger element in a manner providing some play in the connection of each of said finger elements to said oscillating means; and

e. said finger elements being of sufficient length to enable said resilient elements to impart a whipping motion to said finger elements upon oscillation thereof to shake the crops off the plants.

4,014,161
STOP-MOTION DEVICE FOR AUTOMATIC DOFFER APPARATUS

William L. Cox, Pickens, S.C., assignor to Platt Saco Lowell Corporation, Greenville, S.C.

Filed May 26, 1976, Ser. No. 690,214
Int. Cl.[2] D01H *9/04, 13/14*
U.S. Cl. 57—52 11 Claims



1. In an automatic bobbin doffing apparatus servicing a textile spinning frame or like machine having a plurality of upstanding bobbin receiving spindles mounted in a row extending longitudinally of the machine, said apparatus including an elongate bobbin grasper member extending in generally parallel adjacent relationship to said row of spindles, an elongate draw bar mounted in generally parallel underlying relationship to said bobbin grasper member for linear reciprocatory movement, and linkage means interconnecting said bobbin grasper member and said draw bar for movement of said bobbin grasper member between elevated and lowered positions relative to said row of spindles in response to reciprocatory movement of said draw bar, the improvement comprising:

said linkage means including at least one linkage mechanism having a lower end portion connected to said draw bar for linear movement in unison therewith during normal operation of said apparatus and for relative linear movement between said draw bar and said lower end portion of said linkage mechanism upon impedence of said movement of said bobbin grasper member;

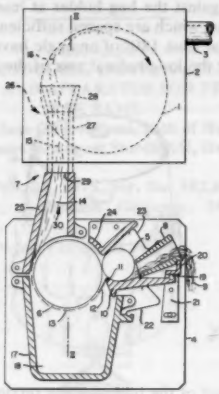
and stop-motion means actuable in response to said relative linear movement between said lower end portion of said linkage member and said draw bar for, upon actuation, halting operation of said apparatus.

4,014,162
FIBER SUPPLY DUCT FOR AN OPEN-END SPINNING UNIT

Hans Stahlecker, Sussen, Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Germany

Filed Oct. 24, 1975, Ser. No. 625,713
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.95 10 Claims

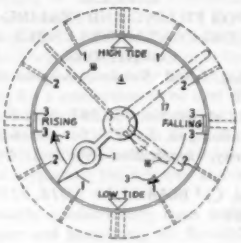
1. Fiber supply duct for an open-end spinning unit with an opening device, especially an opening roller, for the opening up of continuously fed fiber material, this opening device being followed by the fiber supply duct terminating in a spinning rotor, an air current effecting a conveyance of the fibers being generated in this fiber supply duct by means of a negative pressure ambient in the zone of the spinning rotor, characterized in that the fiber supply duct is provided with a steadily widening flaring mouth, and characterized in that the supply duct comprises a tapering section beginning at the opening means and tapering in the conveying direction of the fibers, and a flaring section constituting the flaring mouth.



4,014,163
CLOCKWORK FOR DESIGNATING TIME AND TIDE

Otto Wisser, Ludwig Uhlandstr. 12, 7745 Schonach, Germany

Filed Aug. 18, 1975, Ser. No. 605,650
Claims priority, application Germany, Nov. 19, 1974, 2454761
Int. Cl.[2] G04B *19/26*
U.S. Cl. 58—3 2 Claims



1. A clockwork comprising

a. a casing having a front face with time indications and tide indications,

b. a driven hour hand shaft journaled in said casing and having an hour hand thereon movable around said face,

c. a first gear rotatable on said shaft,

d. a slip clutch connected between said first gear and said shaft arranged to normally drive said gear with said shaft but allowing adjustable rotation relative thereto,

e. a second gear secured on said shaft for rotation therewith,

f. a tide hand secured to said second gear and movable around said face,

g. a connecting gear in common mesh with said first and second gears for connecting said gears in unitary rotation,

h. Said second gear having a different number of teeth than said first gear whereby to operate said tide hand at a different speed to proportion the rise and fall of the tides with the hours of the day,

i. and means secured to said connecting gear for manually rotating it to set said tide hand by slippage of said first gear on said shaft.

4,014,164
ELECTRONIC TIMEPIECE INCLUDING BATTERY MONITORING ARRANGEMENT

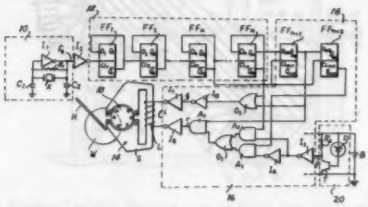
Kinji Fujita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,517

Claims priority, application Japan, Mar. 27, 1974, 49-34241

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 BA **12 Claims**



1. In an electronic timepiece having a battery monitoring arrangement and including oscillator means for producing a high frequency time standard signal, divider means including a plurality of series-connected divider stages adapted to produce low frequency signals in response to said high frequency signal applied thereto, a battery coupled to said oscillator means and said divider means for energizing same, a stepping motor including a rotor adapted to be rotated in response to each driving pulse applied to the step motor, and a display means including at least one hand adapted to be rotated in response to each rotation of said rotor, the improvement comprising detection means coupled to said battery for detecting the potential thereof, said detecting means producing a signal in response to detecting a potential below a predetermined level, and monitoring circuit means coupled to said detection means and to said divider means for receiving said low frequency signals and in response thereto, applying periodic drive pulses to said step motor to effect a first periodic rotation of said rotor and thereby effect a first periodic advancing of said hand, said monitoring circuit means being further adapted to apply different periodic drive pulses to said step motor in response to a signal applied from said detection means to effect a second and different periodic rotation of said rotor and thereby effect a second and different advancing of said hand to indicate said battery potential being below a predetermined level.

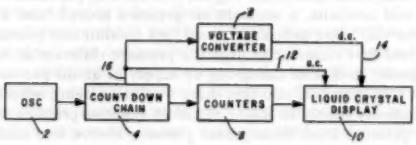
4,014,165
DC-DC CONVERTER IN WATCH SYSTEM

Troyce D. Barton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 454,052, March 25, 1974, Pat. No. 3,919,625. This application July 14, 1975, Ser. No. 595,975

Int. Cl.² G04C *3/60;* **G05F** *1/58*

U.S. Cl. 58—23 BA **10 Claims**



1. A solid state electronic watch comprising an oscillator providing a relatively high frequency signal, frequency divider means coupled to said oscillator for providing a plurality of relatively low frequency signals including a one Hertz signal, a plurality of interconnected counters responsive to said one Hertz signal for providing a plurality of time signals representative of time information, a liquid crystal display coupled to said counters having a plurality of digits for displaying time information and powered by a relatively high DC supply voltage, and a voltage converter coupled to receive a relatively low DC supply voltage and responsive to one of said low frequency signals for generating relatively high DC supply voltage to said liquid crystal display, said voltage converter being comprised of one shot multivibrator means coupled to a switching regulator, said one shot multivibrator means being responsive to said one low frequency signal and said switching regulator providing said relatively high DC supply voltage.

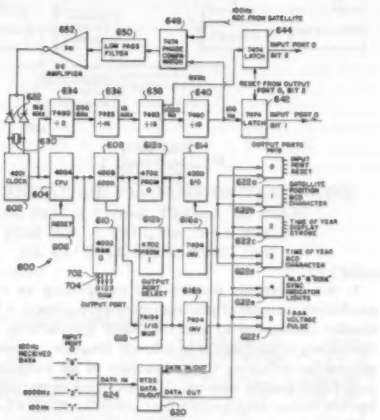
4,014,166
SATELLITE CONTROLLED DIGITAL CLOCK SYSTEM

Joseph V. Cateora; Dicky D. Davis, and D. Wayne Hanson, all of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 657,918

Int. Cl.² G04C *13/08;* **H04B** *7/00*

U.S. Cl. 58—26 R **10 Claims**



1. A digital clock system in which a data stream is transmitted at a precise data rate, the data stream comprising a plurality of contiguous data records, each data record comprising a plurality of data blocks, each of said blocks having a data synchronization segment and a message code segment, the message code segments within a data record forming a time code message and said message including a message synchronization portion and a time-of-year portion, said clock system comprising:

receiver means for receiving the transmitted data stream;

a clock means for generating clock pulses at regular intervals;

phase lock loop means for phase locking said clock means to the precise data rate of said data stream; and

logic means for detecting the data synchronization segment of a data block so as to determine the position of each following message code segment in the received data stream, for detecting the message synchronization portion of the time code message so as to determine the beginning of the time code message, for assemblying the complete time code message from the individual received message code segments, for keeping time by counting said clock pulses, for comparing each complete time code message with the time represented by said counted clock pulses so as to provide a determination of whether said time coincides with the complete time code message, and for correcting the time represented by said counted clock pulses so that said time coincides with the complete time

code message, responsive to a predetermined number of determinations of non-coincidence between said time and said complete time code message.

4,014,167

ELECTRONIC METRONOME

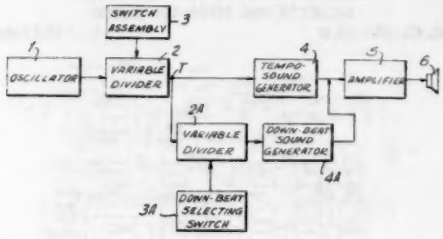
Ryozo Hasegawa, 6-2-10, Nakano, Nakano, Tokyo, Japan, and Yasuhiro Saito, 4-38-17, Kitakoiwa, Edogawa, Tokyo, Japan

Continuation-in-part of Ser. No. 342,082, March 19, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,564

Claims priority, application Japan, Mar. 21, 1972, 47-27445

Int. Cl.² G04F 5/02; G10H 5/06

U.S. Cl. 58—130 E **9 Claims**



1. An electronic metronome comprising an oscillator for producing a signal of predetermined frequency, a first variable divider connected to said oscillator for variably dividing the frequency of said signal to a lower frequency, tempo selecting means for selecting the frequency of an output signal from said first variable divider, light emitting elements, a scanning circuit connecting to said first variable divider for energizing said light emitting elements in succession in response to the output signal generated by said tempo selecting means thereby to display a tempo in a flow of light, said scanning circuit generating at an output terminal thereof a tempo signal to be obtained, a tempo-sound generator connected to said scanning circuit and responsive to said tempo signal for generating a tempo-sound signal, a second variable divider connected to said scanning circuit for variably and further dividing the frequency of the signal obtained thereby to a lower frequency, down-beat selecting means for selecting the frequency of an output signal from said second variable divider to be equal to that of a down-beat sound to be obtained, a down-beat sound generator connected to said second variable divider and responsive thereto for generating said down-beat sound, and means for audibly displaying said tempo-sound obtained by said tempo-sound generator and said down-beat sound obtained by said down-beat sound generator to generate a regularly accentuated tempo-sound.

4,014,168

ELECTRICAL TECHNIQUE

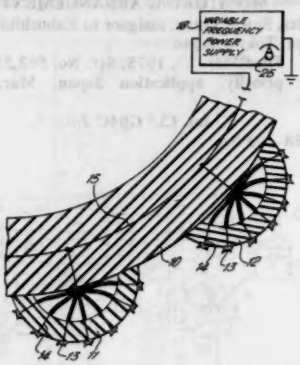
Donald G. Carpenter, Box 62 A, North Granby, Conn. 06060

Continuation of Ser. No. 95,754, Dec. 7, 1970. This application May 30, 1974, Ser. No. 474,379

Int. Cl.² F02K 9/00

U.S. Cl. 60—202 **10 Claims**

1. An ionization system comprising an electrically insulating dome, a plurality of electrodes embedded in said dome and having protruding hemispherical portions, a plurality of cones



protruding from each of said hemispherical portions, and conductor means for coupling power to said electrodes.

4,014,169

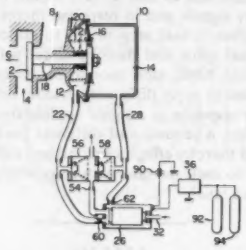
ANTI-AFTERBURN DEVICE FOR ENGINE HAVING AIR PUMP

Hideo Umino, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1975, Ser. No. 565,966

Int. Cl.² F02B 75/10

U.S. Cl. 60—290 **6 Claims**

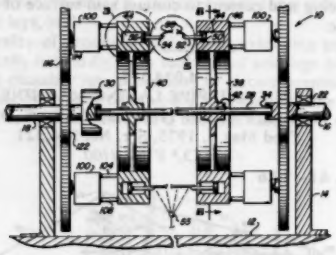


1. An anti-afterburn device for an engine having an air pump, comprising a control valve for controlling air supply, a pressure differential means dividing a housing into first and second chambers and being connected to said control valve, a spring urging said control valve in one direction, first and second conduits connecting respectively said chambers with an intake manifold of the engine, a first orifice provided in one of said conduits, a separate air pressure source, and a first three-way valve provided in said first conduit and connected to said first chamber to urge the pressure differential means opposite to that of the spring by supply of an air pressure to the first chamber, said first three-way valve being adapted to selectively supply an intake manifold negative pressure or the air pressure from the separate pressure source into said first chamber, said control valve being operable to reduce the air supply upon abrupt pressure change in said intake manifold or upon supply of the air pressure from the separate pressure source, said first orifice being provided in said second conduit, and a first check valve is located in parallel with said first orifice, said check valve permitting a communication only from said second chamber to the intake manifold.

4,014,170
THERMAL ENGINE

Roger L. Kitterman, Star Rte. Box 644, Tonopah, Ariz. 85354

Filed Jan. 8, 1976, Ser. No. 647,621
Int. Cl.² F03G 7/06
U.S. Cl. 60—529 8 Claims

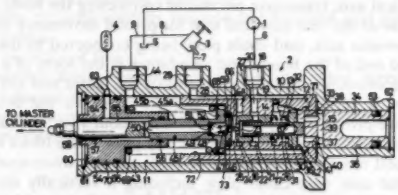


1. A thermal motor for converting heat energy to mechanical energy comprising:
   a. a rotor defining a plurality of cylinder chambers each having a reciprocable piston therein;
   b. heat-responsive means which mechanically move in response to a temperature change operatively connected to said pistons;
   c. a hydraulic circuit including a hydraulic motor having an output shaft, said circuit interconnecting said cylinder chambers with said motor whereby reciprocation of said piston actuates said motor; and
   d. means for rotating said rotor a predetermined rotational speed to selectively expose said heat-responsive means to a heat source.

4,014,171
HYDRAULIC BRAKE BOOSTER

Uichiro Kobashi, Okazaki, Japan, assignor to Aisin Seiki Co., Ltd., Japan

Filed June 10, 1975, Ser. No. 585,682
Claims priority, application Japan, June 10, 1974, 49-65047
Int. Cl.² F15B 7/00
U.S. Cl. 60—547 9 Claims

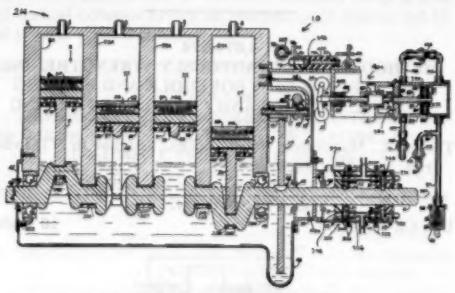


1. A hydraulic brake booster comprising:
a fluid pressure source;
a booster having a bore therein;
steped power piston means, slidably disposed within said bore of said booster housing, operatively connected at one end thereof with a master brake cylinder means and forming at the other end thereof a fluid chamber the hydraulic fluid pressure of which actuates said power piston means for in turn actuating said master cylinder means;
a guide member provided within said bore of said booster housing at the opposite side of said fluid chamber for guiding the sliding movement of a small diameter portion of said stepped power piston means;
first fluid passage means provided within said guide member and said small diameter portion of said stepped power piston means, one end of said first fluid passage means being fluidically communicated with said fluid pressure source;
second fluid passage means, one end of which fluidically communicates with the other end of said first fluid passage means and the other end of which communicates with said fluid chamber within said bore of said booster housing;
third fluid passage means, one end of which communicates with said fluid chamber, and said third fluid passage means further communicating with a fluid reservoir;
a first valve interposed between said first and second passage means and normally blocking communication therebetween;
a second valve interposed between said fluid chamber and said third fluid passage means and normally permitting communication therebetween; and
input piston means slidably disposed within said bore of said booster housing actuated by a manual brake means, said input piston means being operatively connected with said first and second valves for actuating them during a braking operation.

4,014,172
DIFFERENTIAL AIR PRESSURE DRIVEN ENGINE

Thomas Jones, 5633 S. Loomis, Chicago, Ill. 60636

Filed Nov. 3, 1975, Ser. No. 628,519
Int. Cl.² F01K 25/00; F02G 1/00
U.S. Cl. 60—650 13 Claims



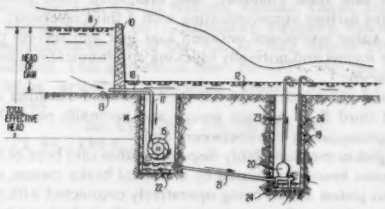
1. An air driven engine apparatus comprising:
an engine block having a plurality of cylinders each having a piston reciprocably mounted therein and connected in cranking relation to a crank shaft journalled in the engine,
a source of heated air under pressure,
a source of vacuum under refrigerated conditions,
a cylinder air flow input timer,
air pressure conduit means connecting the source of air under pressure to said input timer including valve means for controlling the volume rate of air flow to said timer,
and a cylinder air flow output timer,
air vacuum conduit means connecting said output timer to the source of vacuum including a vacuum timer,
said cylinders each having a separate conduit communicating between same and said timers,
said timers being oriented to, for each cylinder, sequentially connecting such cylinder only to the source of air under pressure on the power stroke of the piston thereof, and sequentially connecting such cylinder only to the source of vacuum on the return stroke of the piston thereof.

4,014,173

SYSTEM FOR INCREASING THE EFFECTIVE HEAD OF A DAM WITHOUT PHYSICALLY INCREASING THE HEIGHT OF THE DAM

Walter William Keeling, R.F.D. No. 1, Troutville, Va. 24175

Filed Nov. 5, 1975, Ser. No. 628,936
Int. Cl.² E02B 9/00
U.S. Cl. 61—19 **4 Claims**



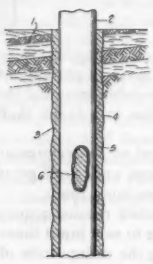
1. A hydroelectric power generating system comprising a man-made dam of predetermined fixed height above a water stream bed forming an elevated head of water behind the dam, a first subterranean well pit somewhat downstream from the base of the dam and extending for a substantial distance below the base of the dam to increase substantially the effective head of the dam, said well pit being substantially closed at its sides and bottom, hydroelectric generating means near the bottom of the first well pit, means delivering dam head water to said generating means near the bottom of the well pit, a second subterranean well pit downstream from the first pit hydraulic ram means in the second well pit adapted to elevate water therein to the tailwater downstream from said dam, and gravity flow conduit means interconnecting said well pits whereby discharge water from said generating means in the first well pit is delivered to said hydraulic ram means in the second well pit continuously.

4,014,174

METHOD OF SIMULTANEOUSLY STRENGTHENING THE SURFACE OF A BOREHOLE AND BONDING CEMENT THERETO AND METHOD OF FORMING CEMENTITIOUS PILINGS

Thomas C. Mondshine, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,469
Int. Cl.² E02D 5/42, 5/62
U.S. Cl. 61—53.52 **10 Claims**



1. A method for simultaneously consolidating the surface of a borehole and bonding cement to the surface of said borehole, which comprises:

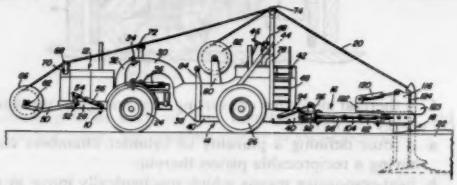
a. placing an aqueous salt solution containing at least 0.5% of a multivalent cation salt into a borehole;
b. forcing said salt solution into the formation surrounding said borehole;
c. displacing said salt solution from said borehole;
d. placing an alkali metal silicate solution which has a pH less than 12.0 containing at least 12 percent by weight silica within said borehole;
e. forcing said silicate solution into said formation;
f. displacing said silicate solution from said borehole;
g. placing an aqueous cement slurry containing at least 2 percent by weight of a water soluble multivalent cation salt within said borehole; and
h. forcing said cement to contact said surface of said borehole.

4,014,175

CABLE AND PIPE LAYING MACHINE

Douglas F. Brink, P.O. Box 1186, Rapid City, S. Dak. 57701

Filed May 5, 1975, Ser. No. 574,321
Int. Cl.² F16L 1/00
U.S. Cl. 61—72.6 **6 Claims**



1. A cable and pipe laying machine for direct underground burial of flexible cables, pipes, lines and the like comprising a front powered unit, a rear powered unit and means articulately interconnecting the front and rear powered units, each of said units including a prime mover and driven traction means, only said rear powered unit including an operator's station thereon by which the machine may be controlled, a drawbar assembly attached to the rear of the rear powered unit and a cable laying plow attached to said drawbar assembly in position for observation from the operator's station, said articulate connecting means including power means to vary the angular relation between the front powered unit and rear powered unit for steering control of the machine, said operator's station being disposed rearwardly of the interconnecting means to enable forward observation of the front unit and the angular relation between the units for effective steering control of the machine by a single operator, said drawbar assembly including an elongated boom, an adapter in the form of a body connected to the forward end of the boom by a vertical pivot pin to enable swinging movement of the boom about a vertical axis, transverse pin means connecting the body to the frame of the rear powered unit for pivotal movement about a transverse axis, said cable plow being connected to the rearward end of the boom, and an adapter in the form of a block interconnecting the rearward end of the boom and the cable plow, a vertical pin connecting the block to the boom to enable pivotal movement of the block about a vertical axis and a transverse pin connecting the cable plow to the block enable pivotal movement of the cable plow about a transverse horizontal axis, said cable plow including a vertically disposed share having guide means thereon for guiding a cable downwardly into a trench formed by the plowshare, and power operated means for varying the body, boom, block and cable plow about their various axes of movement.

4,014,176

METHODS AND APPARATUS FOR APPLYING BUOYANT FORCES TO OFFSHORE TOWER LEGS AND PROVIDING AND ENCLOSING BUOYANCY CHAMBERS

Jay B. Weidler, Jr., Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Sept. 4, 1975, Ser. No. 610,277
Int. Cl.² E02B 17/00
U.S. Cl. 61—87 **16 Claims**

1. An offshore tower assembly having a support frame structure arranged to be disposed on the bed of a body of water, said support frame structure comprising:

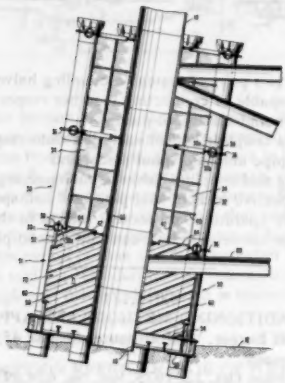
a plurality of legs;

a plurality of piling guides disposed around and connected to at least one of said legs, said piling guides being operable to telescopingly receive piling members for anchoring said frame structure to said bed of said body of water; and

a buoyancy unit disposed at a lower portion of at least said one of said legs, said buoyancy unit comprising

walls means defining a chamber encircling said one of said legs, and

a plurality of generally upright fins extending generally radially outwardly from said one of said legs to divide said chamber into a plurality of circumferentially displaced buoyancy cells arranged about said one of said legs for the reception of a buoyant medium



said fins being connected to said piling guides and operable to transmit forces in a generally uniform manner between said one of said legs and said piling guides connected thereto by way of said fins

said plurality of buoyancy cells

being contiguous with and radiating outwardly from said one of said legs,

being individually operable to define separate, buoyancy medium containing chambers,

being circumferentially interspersed between said piling guides;

said plurality of fins

defining force transmitting means extending directly between said one leg and said piling guides, and

circumferentially alternating with and separating said plurality of buoyancy cells.

4,014,177

MARINE PIER HAVING DEEPLY SUBMERGED STORAGE CONTAINER

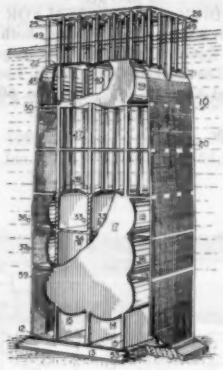
Gerard Eugene Jarlan, Versailles, France, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 503,079, Sept. 6, 1974. This application Sept. 26, 1975, Ser. No. 617,091

Int. Cl.² B65G *5/00*; **B63B** *35/00*; **E02D** *17/00*

U.S. Cl. 61—87 **50 Claims**

1. A marine pier structure for sited in the sea on a seabed in depth at least 400 feet, comprising a base slab of rectangular plan form, spaced parallel upright load-carrying walls rising from the base, a container body having parallel plane end walls and a convexly-lobed side wall integrally joined with said end walls and together enclosing a space, said upright walls extending through said container body and supporting said container body in spaced relation above said base and terminating in the sidewall at its upper surface, a system of tubular vertical columns arrayed in parallel files along said terminations of said upright walls and extending to a height near the sea surface, a pair of upright flanking load-carrying walls spaced symmetrically to either side of and parallel with said upright walls a distance about 60 feet from the container side wall, a top wall joining the upper extremities of said flanking walls and a series of tiers of tubular brace members orthogonally disposed to said flanking walls and to said vertical columns and monolithically joined therewith, said flanking walls being extensively perforated by a large multiplicity of regularly distributed transverse jet-guiding channels opening through the walls, having a combined cross-sectional channel area at least about 30% of the elevational area of the walls, a deckwork supported on said upright walls and vertical columns above the sea, and an enclosed chamber integral with said vertical columns having an internal space intersected by said tubular vertical columns.



4,014,178

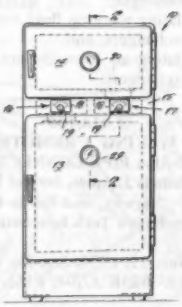
REFRIGERATOR TEMPERATURE CONTROLS

John D. Kells, 1678 71st St., Brooklyn, N.Y. 11204

Filed May 3, 1976, Ser. No. 682,569

Int. Cl.² F25B *21/02*, *49/00*; **F25D** *11/02*, *13/02*

U.S. Cl. 62—3 **3 Claims**



1. In a refrigerator incorporating exterior temperature control means, the combination of a refrigerator having a cool compartment and a freezer compartment, a front door for each said compartment, a control panel for each said compartment located on an exterior wall of said refrigerator, each said control panel including a fixed, temperature calibrated dial with rotatable knob having an attached indicating needle,

constituting means to select and maintain a desired temperature level for its respective compartment in conjunction with a thermo electric mechanism, a temperature insulated space embodied in the refrigerator, convenient to the cool compartment and freezer compartment thereof, said space divided into two chambers, temperature insulated from each other, said chamber housing an externally controlled thermostatic element, each chamber having an air conduit, opening into its respective compartment.

4,014,179

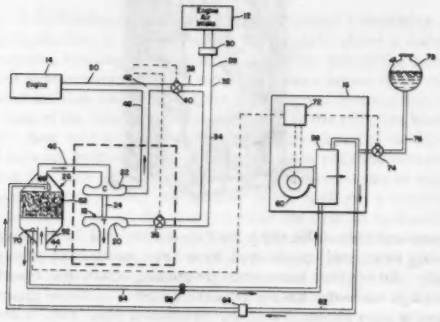
AIR CONDITIONING SYSTEM FOR AIRCRAFT

Thomas L. Iles; Kwang-Chou Hwang, both of Rancho Palos Verdes, and Robert C. Kinsell, Los Angeles, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,127

Int. Cl.² F25B *9/00*

U.S. Cl. 62—88 **14 Claims**



1. In combination:
an enclosure containing air;
an engine having an air intake source of air at substantially ambient pressure;
turbine means for receiving air from the source and expanding the air to reduce its temperature and pressure;
a first heat exchanger means for receiving air from the turbine means for cooling a working fluid in the heat exchanger;
compressor means driven by the turbine means for compressing air from the heat exchanger and feeding the air to the engine air intake;
a second heat exchanger;
means for circulating working fluid between the first and second heat exchangers; and
means for circulating air from the enclosure through the second heat exchanger.

4,014,180

METHOD FOR MAKING A REMOTE CONTROLLED SUB-SEA PIPE CONNECTION

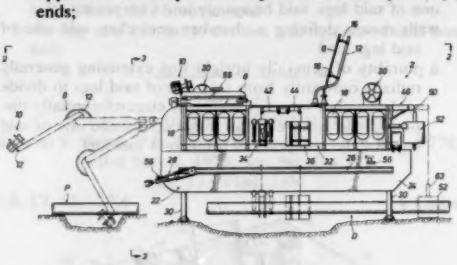
James A. Kelly; Thomas J. Ames, both of Houston, Tex.; Glen E. Lochte, Asker, Norway, and Burlie R. Bowen, Houston, Tex., assignors to Hydro Tech International, Inc., Houston, Tex.

Filed Nov. 21, 1975, Ser. No. 633,965

Int. Cl.² B23K *37/04;* **F16L** *23/00*

U.S. Cl. 61—110 **9 Claims**

1. A method of repairing a damaged section of a pipeline on a sea bottom remotely controlled from the sea surface comprising the steps of:
supporting a pipe cutter on a remote controlled first vehicle;
lowering said first vehicle toward said damaged pipeline section with said pipe cutter supported thereon;
cutting said pipeline on opposite sides of said damaged pipe section by remotely operating said pipe cutter via said first vehicle;
lowering a remote controlled second vehicle toward said damaged pipe section;
removing said damaged pipe section with said second vehicle to thereby expose a pair of spaced pipe ends;
lowering with said second vehicle a pipe spool-piece having opposed ends disposable adjacent to said spaced pipe ends;



providing two pairs of mateable coupling halves, each pair being capable of connecting together respective ends of said pipe and said spool-piece;
installing a coupling half of each pair onto respective ends of said pipe and said spool-piece, and
connecting said coupling halves of each pair together and to the respective ends of said pipe and said spool-piece by remotely operating said second vehicle to thereby effect said pipe connection between said spaced pipe ends.

4,014,181

AIR CONDITIONING METHODS AND APPARATUS

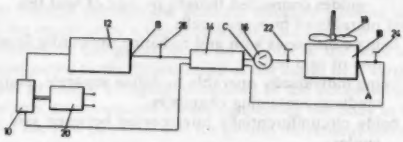
Manfred Rolf Burger, Wolfratshauser Strasse 45/I, 8023 Pullach, Germany

Filed Oct. 22, 1975, Ser. No. 624,893

Claims priority, application Germany, Nov. 5, 1974, 2452508; May 23, 1975, 2522967

Int. Cl.² F25B *45/00*

U.S. Cl. 62—114 **13 Claims**



1. In a closed-circuit cooling process in which a working fluid is successively compressed, condensed through the removal of heat, expanded, and vaporized by take-up of heat from a fluid to be cooled, before being again compressed, the improvement comprising the steps of providing a working fluid by mixing a refrigerant, having a boiling point within the range 0° to 60° C at atmospheric pressure, with air having a partial pressure prior to use and throughout at least a major part of the volume of the circuit, of not less than 0.05 atmospheres absolute.

4,014,182

METHOD OF IMPROVING REFRIGERATING CAPACITY AND COEFFICIENT OF PERFORMANCE IN A REFRIGERATING SYSTEM, AND A REFRIGERATING SYSTEM FOR CARRYING OUT SAID METHOD

Eric G. U. Granryd, Slatthalsvagen 2, S-183 64 Taby, Sweden

Filed Oct. 7, 1975, Ser. No. 620,364

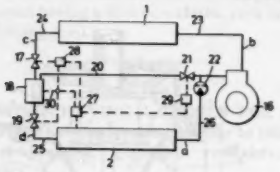
Claims priority, application Sweden, Oct. 11, 1974, 7412825

Int. Cl.² F25B *5/00, 41/00, 1/10*

U.S. Cl. 62—117 **16 Claims**

1. A method of improving refrigerating capacity and coeffi-

cient of performance in a refrigerating system comprising an evaporation apparatus, a condensor apparatus, and a compressor apparatus the latter being adapted for sucking in via a first conduit means and compressing refrigerant evaporated in the evaporation apparatus for transferring the compressed refrigerant via a second conduit means to the condensor apparatus, from which a regulated amount of condensed refrigerant is transferred to at least one closed vessel, said amount not being sufficient to fill the vessel, the closed space above the liquid level in the vessel being connected via a third conduit

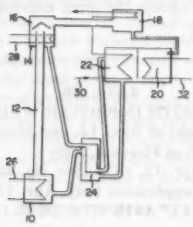


means to the suction side of the compressor, there being a fourth conduit means for supplying refrigerant to the evaporation apparatus from the vessel, characterized in that communication through said third conduit means is opened for a regulated period of time to lower the pressure in the vessel and to cause the refrigerant therein to boil, that communication through said first conduit means is kept closed during the main portion of this period of time and that thereafter communication through said third conduit means is closed and communication through said first conduit means is opened.

4,014,183
ABSORPTION REFRIGERATOR OF NATURAL CIRCULATION TYPE

Toshihiro Ishibashi, and Satoshi Naito, both of Kosai, Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1975, Ser. No. 586,041
Claims priority, application Japan, July 2, 1974, 49-75020
Int. Cl.² F25B *15/00, 33/00*
U.S. Cl. 62—476 **1 Claim**

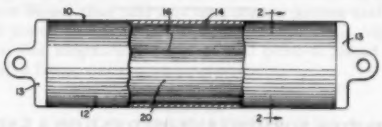


1. An absorption refrigerator of natural circulation type employing water as a refrigerant and lithium salt as an absorbing medium comprising generating means for expelling water vapor from an aqueous solution of lithium salt, a separator for separating the expelled water vapor from the concentrated lithium salt solution, a condenser for condensing the water vapor separated in said separator; an evaporator having a second refrigerant flowing therethrough for vaporizing the water condensed in said condenser and thereby cooling the secondary refrigerant flowing therethrough by the latent heat of vaporization of water; and an absorber for reintroducing the water vapor vaporized in said evaporator into the concentrated lithium salt solution, characterized in that the generating means comprises a first generator for expelling water vapor from the aqueous solution of lithium salt to lift the lithium salt solution through a gas-liquid lift according to the principle of an air lift pump for the purpose of causing the natural circulation of the lithium salt solution, a second generator connected by said gas-liquid lift to said first generator for concentrating the lithium salt solution fed thereto by heating it so as to expel additional water vapor therefrom to concentrate said lithium salt solution to the predetermined concentration, and wherein the ratio between the quantity of heat Q_1 applied to said dilute lithium salt solution in said first generator and the total quantity of heat Q_t applied to the system is selected to be equal to the ratio $(\epsilon_2 - \epsilon_1)/\epsilon_2 - \epsilon_1)$, where ϵ_1 is the original concentration of said dilute lithium salt solution, ϵ_2 is the concentration of said lithium salt solution heated to boil in said first generator, and ϵ_3 is the concentration of said concentrated lithium salt solution.

4,014,184
PROPELLER SHAFT LINER AND INSERTING APPARATUS

Martin H. Stark, 109 N. Wheeler, Saginaw, Mich. 48602

Filed Jan. 27, 1975, Ser. No. 544,236
Int. Cl.² F16C *1/00*
U.S. Cl. 64—1 V **11 Claims**

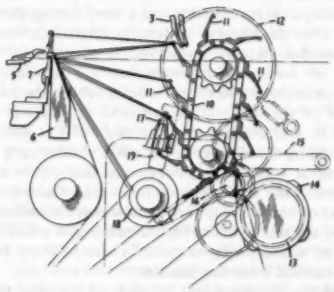


1. A liner for a hollow, cylindrical member having a bore of predetermined diameter, said liner comprising a tube of flexible material and of substantially uniform wall thickness, said tube having an outside diameter greater than that of said bore, the entire cross section of the wall of said tube being radially deformed to provide a plurality of longitudinally extending, circumferentially spaced, concavo-convex grooves which enable a resiliently resisted, radial compression of said tube at said grooves to a lesser outside diameter sufficient to permit insertion of said tube in said bore.

4,014,185
METHOD OF MANUFACTURING KNITTED LONG-PILE FABRICS AND FABRICS MADE BY THE METHOD

Tsutomu Kaido, Sakai; Seiichi Asahi, Ashiya, and Sinjiro Nishikawa, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1974, Ser. No. 507,612
Int. Cl.² D04B *23/06, 23/08, 23/10, 23/12*
U.S. Cl. 66—84 R **8 Claims**



1. A Warp knitting machine for knitting long-pile fabrics, comprising means for knitting ground stitches including latch needles and guide bars for ground yarn, guide bars for pile yarn provided separately from the guide bars of said means for knitting ground stitches, and means for cutting pile loops

provided at a variable distance in front of said means for knitting ground stitches and including a pile cutting device and a hook needle unit comprising a plurality of hook needle blocks attached to endless conveyer chains and movable in an endless intermittent revolution, said guide bars for pile yarn being movable in a swinging motion back-and-forth between the rear of the position where ground stitches are formed and the front of a hook needle block of said hook needle unit so as to dispose pile yarns between the latch needles of the means for knitting ground stitches and the hook needles on the hook needle block thus to incorporate the pile yarns into the ground stitches in the form of pile loops, said hook needle unit being operable to hang said pile yarns on hook needles on a hook needle block and to shift one pitch after a knitting cycle is completed to set the next hook needle block in position, and said pile cutting device being operable to cut the pile loops under a tension-free condition at least one cycle later than the loop formation.

4,014,186

METHOD OF FORMING A CLOSED END ON A KNITTED TUBULAR FABRIC

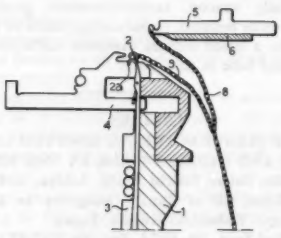
Luigi Ferraguti, Condove (Turin), Italy, assignor to Matec S.p.A., Scandicci (Florence), Italy

Filed Jan. 2, 1976, Ser. No. 646,104

Claims priority, application Italy, Mar. 12, 1975, 67621/75

Int. Cl.² D04B *15/02, 9/54, 9/56*

U.S. Cl. 66—95 **4 Claims**



3. A method for forming a closed end on a tubular knitted fabric, particularly on a stocking, on a circular knitting machine having a single cylinder and a cooperating circular dial, wherein, after the last row of tubular fabric has been formed by the needles slidably assembled in grooves in the lower cylinder, an inner and an outer annular tubular layer are formed as continuations of the tubular fabric, the loops at the free edge of the inner layer are held on support members arranged in a circle and the free edge of the outer tubular layer is held by the needles of the said cylinder until a relative rotation of at least 180° between the said circle of support members and the said cylinder has been effected, when the loops held on the said support members are transferred to the needles of the said cylinder for the making of a final few turns or rows of substantially runproof close knitting before the fabric is cast-off from the needles,

wherein the improvement consists in forming the double fabric of the toe by the use of the needles carried by the said cylinder successively in two sections, the inner layer being formed first by some of the needles of said cylinder, the outer layer then being formed by the remaining needles of the said cylinder whilst the free edge of the inner layer remains held on the support members arranged in a circle above said cylinder.

4,014,187

FABRIC SPREADER FOR CIRCULAR KNITTING MACHINE

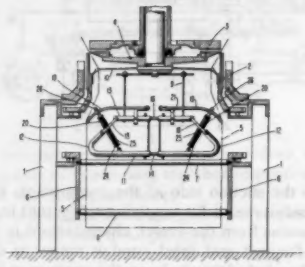
Rudolf Bandoch, Bilovice; Miroslav Marecek, and Otto Rotkerl, both of Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Sept. 11, 1974, Ser. No. 505,002

Claims priority, application Czechoslovakia, Sept. 12, 1973, 6301/73

Int. Cl.² D04B *35/00*

U.S. Cl. 66—147 **5 Claims**



1. In a fabric spreader for goods knitted on a circular knitting machine, said machine having a system of main knitting elements and means for taking up the knitted goods under tension, the fabric spreader being disposed between the main knitting elements and the take-up means, the fabric spreader comprising a flat expanding frame adjustable in width, a plurality of flat expanding wings carried by the frame and situated transverse to the taken-up knitted goods, means coupled to an inner portion of each wing for slidably mounting the associated wing for transverse movement on the frame, additional means associated with the slidable mounting means for pivotally supporting the associated wing on the frame, and means individually connected to respective portions of each wing and independent of the slidable mounting means and the pivotal supporting means for adjustably spring-loading the associated wing on the frame against the force exerted on such wing by the taken-up goods.

4,014,188

PANTY HOSE WITH IMPROVED WAIST OPENINGS

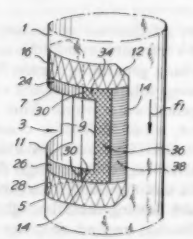
Paolo Conti, Via Neri di Bicci 14, and Massimo Bianchi, Via Bisenzio 33, both of Florence, Italy

Filed Apr. 12, 1974, Ser. No. 460,582

Claims priority, application Italy, Apr. 13, 1973, 9420/73

Int. Cl.² A41B *9/14;* **D04B** *1/00*

U.S. Cl. 66—177 **5 Claims**



1. A knit construction for the waist portion of a one-piece panty hose comprising a tubular knit portion of body yarn having a generally rectangular waist opening including upper and lower transverse edges and a pair of longitudinal side

edges therein, said body yarn being sheared longitudinally along said longitudinal side edges, said waist opening extending partially around the circumference of said tubular portion, an additional yarn comprising an elastic yarn knitted in selected courses in an outer transverse edge zone above and below each transverse edge of said opening, an inner transverse edge zone immediately adjacent each transverse edge of said opening having selected courses with stitches alternated with tuck stitches whereby the fabric along the edges of said opening offers a high degree of elasticity and a tendency to roll up, and longitudinal outer edge zones including courses having stitches with both elastic and non-elastic yarns alternated with courses having a first non-elastic yarn and a supplementary reinforcing yarn.

4,014,189
HOSE KNITWORK HAVING A CLOSED TOE PORTION

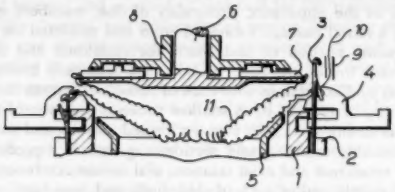
Pavel Uhlir, Trebic, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi, Liberec, Czechoslovakia

Filed June 25, 1974, Ser. No. 482,851

Claims priority, application Czechoslovakia, June 29, 1973, 4723/73

Int. Cl.² D04B *9/54, 9/56*

U.S. Cl. 66—187 **5 Claims**



1. In a knitwork hose, a closed toe portion consisting of a generally symmetrically shaped pocket formed by a pair of marginal end sections and a central section each having a combination of courses of loop wales less than the number in the remainder of the knitwork hose, each of said marginal end sections having an equal number of loops in the same course section, said central section having a higher number of loops in some of said wales and a lower number of loops in the other of said wales in the same course length whereby the stitch density of the central section is less than the stitch density of the marginal sections, said toe being constricted about substantially the center of said central section to close the saem and one of said end sections being doubled over the other and secured together the edges thereof to form said pocket.

4,014,190
WARP KNITTED FOUNDATION FOR SLIDING CLASP FASTENERS

Fumio Terada; Yoshio Matsuda, and Yoshiharu Yamaguchi, all of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 202,083, Nov. 26, 1971, Pat. No. 3,848,556. This application Oct. 1, 1973, Ser. No. 402,379

Claims priority, application Japan, Dec. 4, 1970, 45-108006; Dec. 4, 1970, 45-108007

Int. Cl.² D04B *21/16*

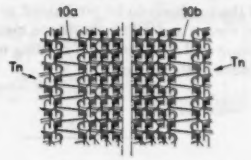
U.S. Cl. 66—195 **7 Claims**

1. A farbic having a warp-knitted structure including a plurality of seams joined by a plurality of water-soluble synthetic fibers disposed in a transverse direction of the fabric at predetermined intervals and extending longitudinally of the fabric, said plurality of water-soluble synthetic fibers comprising first fibers soluble at a first temperature and second fibers soluble at a second temperature higher than the first temperature, ones of said first and said second fibers being alternately disposed in a transverse direction of the fabric.

4. A composite fabric structure comprising, in combination:

a. a plurality of elongated fabric webs each having a pair of opposed longitudinal edges;

b. a plurality of soluble threads soluble at a first temperature joining pairs of said elongated fabric webs together along



adjacent parallel longitudinal edges of said elongated fabric webs; and

c. a plurality of soluble threads soluble at a second temperature higher than said first temperature joining said pairs of joined elongated fabric webs together along adjacent parallel longitudinal edges of said pairs of joined elongated fabric webs.

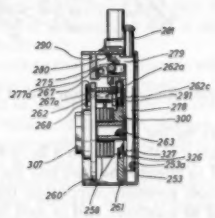
4,014,191
COMBINATION LOCK

Richard P. Harrington, and Russell J. Harrington, both of P.O. Box 474, Mountainburg, Ark. 72946

Continuation-in-part of Ser. No. 479,164, June 13, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,450

Int. Cl.² E05B *37/06*

U.S. Cl. 70—25 **24 Claims**



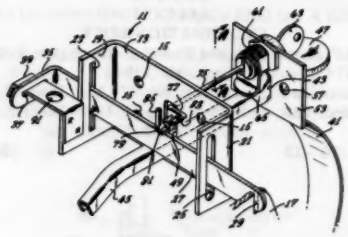
13. A combination lock comprising a housing, a U-shaped bolt having its legs extending into the housing when in its locked position and having one end clear of the housing when in its unlocked position, means holding the bolt in its locked position, fence means including a fence, said fence means being movable between a first position in which the bolt is in its locked position and a second position moving the bolt holding means out of holding engagement to allow the bolt to move to the unlocked position, a plurality of disc-shaped tumblers mounted in side-by-side relationship for rotation around a common axis, each tumbler having a protrusion on its periphery and a gate to receive the fence when the tumbler is in a preselected position, a rotatable dial with a circular, graduated face, means mounting the dial for rotation around an axis perpendicular to the face, a ratchet drum extending across the tumblers and movable by the dial along the outer periphery of the tumblers as the dial is rotated, a plurality of pairs of lugs spaced longitudinally along the ratchet drum with each pair in alignment with one of the tumblers, each pair having one lug in alignment along the drum with one lug of all of the other pairs so that in one position of the ratchet drum one lug of each pair will engage the protrusions and all tumblers will be rotated with the dial to allow the rotation of the dial to bring all tumblers to a predetermined relative predial-

ing position, said other lug of each pair being spaced circumferentially around the ratchet drum different distances from the first lug, means to rotate the ratchet drum on its axis each time the dial is moved in one direction back to a preselected position to position the lugs with the first lug of each pair in position to engage the tumbler with which it is aligned to allow the tumblers to be rotated to said preselected relative predialing position and then successively rotate each tumbler individually in accordance with the combination of the lock to allow the gates of the tumblers to be positioned to receive the fence of the fence means and allow the fence means to move to its second position and move the bolt holding means out of holding engagement with the bolt.

4,014,192
KEYED GATE LATCH

James C. Dillon, Santa Ana, and Milton Robins, Marina del Rey, both of Calif., assignors to PTI-DOLCO, Los Angeles, Calif.

Filed Dec. 12, 1975, Ser. No. 640,181
Int. Cl.² E05B *65/00*
U.S. Cl. 70—77 **12 Claims**



1. A gate latch for cooperation with a latch strike comprising

a latch body having

means thereon about which a latch bolt may be pivotally moved to engage the bolt and the latch strike,

a latch bolt pivotally supported therein and extending beyond at least one end of said body for cooperation with a latch strike,

lever means extending into said body for selective actuation of said latch bolt to disengage the latter from the latch strike, said lever including

means for actuating said lever means from the side of the gate opposite to that upon which said body is mounted,

means for selectively prohibiting actuation of said actuating means without limiting actuation of said latch bolt, and

means for selectively prohibiting actuation of said latch bolt from the side of the gate opposite to that upon which said latch body is mounted including

lock means which may be locked and unlocked from the side of the gate opposite to that upon which said latch body is mounted, and

means actuated by said lock means into abutment with said latch bolt when said lock means is locked for prohibiting disengagement therefrom from the latch strike including

abutment means mounted for rotation, about an axis, in the plane of said latch bolt,

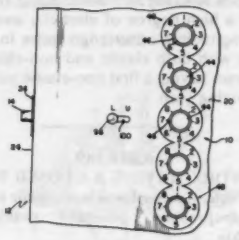
means for supporting said abutment means for such rotation and for movement out of the plane of said latch bolt, and

biasing means for urging said abutment means into the plane of said latch bolt.

4,014,193
LOCKING MECHANISM

Clinton L. Carter, 9510 E. Southport Road, Indianapolis, Ind. 46259

Continuation-in-part of Ser. No. 494,080, Aug. 2, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,152
Int. Cl.² E05B *37/16*
U.S. Cl. 70—288 **7 Claims**

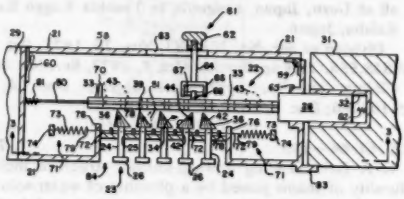


1. A locking mechanism for releasably locking closure apparatus, comprising a plurality of shafts each mounted for rotation about its own axis and for axial movement along its own axis, said shafts each having one end accessible from the outside of the apparatus and a portion inaccessible from the outside of the apparatus; a plurality of disk members each having a radial passage formed therein and mounted on the inaccessible portion of said shafts for rotational and axial movement therewith, each of said disk members having a plurality of disk sections with each of said disk sections having a plurality of radially open shallow recesses and one of said sections having said radial passage formed therein, and means for releasably retaining said sections together in a predetermined rotational and axial relation; dial means connected to the accessible end of each of said shafts and associated with radial indicia and axial indicating means to allow selective rotational and axial positioning of the passages in said disk members; a carriage slidably mounted adjacent said disk members and inaccessible from the outside of the apparatus; a plurality of pins mounted on said carriage and slidably receivable simultaneously into the passages in said disk members when said passages are rotationally and axially aligned therewith; a locking bolt carried on said carriage; and lever means connected to said carriage and operable from the outside of the apparatus to slidably move the carriage between a locked position with said bolt disposed to lock said apparatus and an unlocked position with said pins each received in the radial passage in one of said disk members.

4,014,194
MECHANICAL PUSH BUTTON LOCK

Susan Nilson Hartman, 20 Binnacle Hill, Oakland, Calif. 94618

Filed Jan. 7, 1976, Ser. No. 647,045
Int. Cl.² E05B *37/16*
U.S. Cl. 70—313 **5 Claims**



1. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plural-

ity of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, wherein the improvement in said lock comprises:

each of said elements being formed as a conical member having a longitudinally skewed axis, and

said bolt actuating means being formed as a plate-like member having openings formed therein for receipt of and cooperative engagement of said conical member with a bearing surface defining said opening.

2. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plurality of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, wherein the improvement in said lock comprises:

spring biasing means coupled to each of said push buttons and formed to bias said push buttons to an outermost position, said spring biasing means being further formed to prevent displacement of more than one push button at any one time.

4. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plurality of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, at least two of said elements being formed for cooperative engagement with said bolt actuating means to cause movement of said bolt toward said unlocked position, and the remainder of said elements being formed to cause movement of said bolt toward said locked position, wherein the improvement in said lock comprises:

said push buttons being mounted to said housing in at least two rows with one of the elements causing movement of said bolt toward the unlocked position being positioned in each of said rows of push buttons,

said bolt actuating means is formed as a slide plate having a plurality of openings formed therein, said openings being positioned in said slide plate in at least two rows, and

at least one row of one of said rows of push buttons and said rows of openings being laterally displaced with respect to the remaining row to require sequential inward displacement of said push buttons to effect movement of said bolt to said unlocked position.

4,014,195

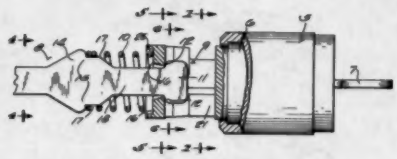
PILLAR LOCK

Robert D. Grogan, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed June 14, 1976, Ser. No. 695,990

Int. Cl.² E05B *17/04*

U.S. Cl. 70—379 R **5 Claims**



1. A lock mechanism of the type comprising a lock cylinder rotatable in a casing by means of a proper key that is axially insertable into the cylinder from a front end thereof, and a shaft projecting rearwardly from the cylinder for transmitting rotation of the cylinder to a latch mechanism, said lock mechanism being characterized by:

A. the shaft being substantially flat and having

1. an enlarged head at a front end thereof that has edge portions spaced to opposite sides of the axis of the shaft to define rearwardly facing shoulders,
2. another enlargement spaced to the rear of said head and having edge portions spaced to opposite sides of the shaft axis to define forwardly facing shoulders, and
3. an elongated neck portion connecting said other enlarged portion with said head;

B. socket means fixed on the rear end portion of the cylinder and having a rear face formed to provide a spring seat, said socket means also having

1. a concentric bore opening to said rear face and in which said neck portion is rotatably receivable,
2. a cavity spaced forwardly of said rear face, to which said bore opens at its front end and in which said head is rotatably receivable,
3. radially extending grooves at opposite sides of the bore which open forwardly to said cavity and endwise into said bore and in which said head is receivable in one position of rotation of the shaft relative to the socket means, said rearwardly facing shoulders being cooperable with the bottoms of said grooves to confine the shaft against rearward movement relative to the socket means, and said grooves being cooperable with said head to confine the shaft in said one position of rotation relative to the socket means while permitting the shaft to have limited flatwise and edgewise swinging motion, and
4. an axially extending groove opening to said bore along the whole length thereof and which is in angularly offset relation to said radially extending grooves, said axially extending groove providing for insertion of the shaft into the socket means, to enable said head to be inserted into the cavity when said shaft is in another position of rotation relative to the socket means; and

C. a coiled expansion spring surrounding said neck portion and reacting between said spring seat on the socket means and said forwardly facing shoulders to confine the head in said radially extending grooves.

4,014,196

STRAIGHTENING APPARATUS

Axel E. Ogren, 855 S. 12th Ave., La Grange, Ill. 60525

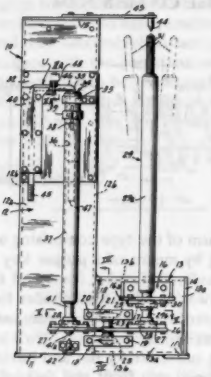
Filed Apr. 6, 1976, Ser. No. 674,120

Int. Cl.² B21D *3/16*

U.S. Cl. 72—316 **15 Claims**

1. An apparatus for bending metal components into exact desired shapes which comprises a frame, a lever fulcrumed on said frame for tilting in all directions, a fixture on said frame

sized for receiving one end portion of a component to be bent, a socket tube on said frame adjacent said fixture for receiving an opposite end portion of the component to be bent, means on said frame tiltably suspending said socket, and a link con-



necting said lever with said socket to tilt the socket relative to the fixture and thereby bend the end portion of the component in the socket relative to the end portion of the component in the fixture.

4,014,197

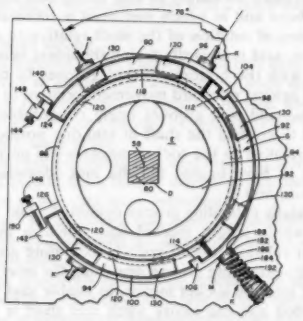
BALL ROUNDING APPARATUS

Arthur W. Lupia, El Paso, Tex.; Jesus Gonzalez, Juarez, Mexico, and Garrett Thurman, El Paso, Tex., assignors to Border Steel Mills, Inc., El Paso, Tex.

Filed Feb. 19, 1976, Ser. No. 659,336

Int. Cl.² B21H *1/14*

U.S. Cl. 72—92 **17 Claims**



1. Ball rounding apparatus comprising; cooperating inner and outer dies having a path therebetween of generally circular cross-sectional shape lying generally on the periphery of a circle, one of said dies being circumferentially continuous and being rotatable relative to the other of said dies about a longitudinal axis, said other die extending over an arc greater than 180° and less than 360° and being circumferentially segmented for movement toward and away from said axis, biasing means for biasing said other die toward said one die and acting generally radially of said axis, said biasing means including a plurality of circumferentially-spaced spring loaded devices, each said spring loaded device including a reciprocable one-piece plunger having an enlarged generally cylindrical head with an outer substantially flat surface engaging a peripheral surface of said other die, an elongated generally cylindrical shaft extending integrally from said head and having a diameter substantially smaller than said head, said shaft merging into said head at a small smoothly curved radius, guide means for guiding said shaft, a coil spring surrounding said shaft between said head and guide means for yieldably biasing said plunger in a direction for engaging said flat surface of said head with said other die, and adjustment means for adjusting said guide means toward and away from said other die to vary the force with which said spring biases said plunger.

4,014,198

DRIVE MECHANISM OF A PAIR OF FORGING OR STRETCHING ROLLERS

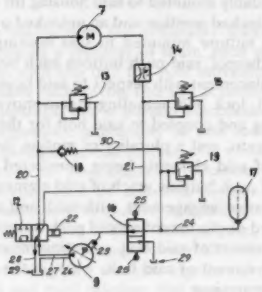
Karl-Heinz Herrmann, Coburg, Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Coburg, Germany

Filed Jan. 12, 1976, Ser. No. 648,020

Claims priority, application Germany, Jan. 10, 1975, 2500756

Int. Cl.² B21B *35/00*

U.S. Cl. 72—249 **5 Claims**



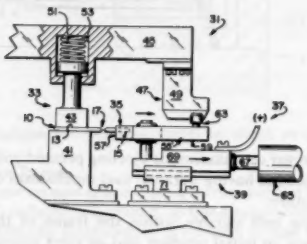
1. In a drive mechanism for a pair of rollers comprising
a pair of rollers operatively connected with each other;
a main drive shaft upon which is mounted one of said rollers;
a hydraulic motor engaging said shaft;
a flowrate-adjustable axial piston hydraulic pump adjusted by tilting;
means for adjusting the flowrate of said pump;
pressure fluid;
a first connecting means for connecting said hydraulic pump with said hydraulic motor;
a fluid reservoir;
a second connecting means for connecting said hydraulic motor with said fluid reservoir;
a third connecting means for connecting said fluid reservoir with said hydraulic pump;
a first switching means interposed in said first and second connecting means for controlling said hydraulic motor; and
a main motor operatively connected to and driving said hydraulic pump;
the improvement comprising:
said means for adjusting the flowrate of said pump comprises a first hydraulic cylinder;
hydraulic means for actuating said first switching means;
a fourth connecting means connecting said first connecting means between said first switching means and said hydraulic motor with said fluid reservoir;
a check valve in said fourth connecting means;
a second switching means operated by means of contacts for simultaneously operating said first hydraulic cylinder and said hydraulic means, said second switching means being interposed in said fourth connecting means between said check valve and said fluid reservoir;
a hydraulic accumulator in said fourth connecting means between said check valve and said second switching means; and

said first switching means being arranged so that when said motor is operating, said pressure fluid flows from said pump through said first connecting means to said motor and from said motor back to said fluid reservoir, and when said motor is stopped said pressure fluid only flows from said pump directly to said fluid reservior, said first and second connecting means being positively isolated from the fluid flow and from each other.

4,014,199
APPARATUS AND METHOD FOR PROVIDING AN ELECTRICAL CONTACT WITH A TIP PORTION SUBSTANTIALLY FREE OF BURRS

Robert Arthur Coons, Pittsfield; Richard Earl Gipe, and Richard Lee Marks, both of Warren, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,400
Int. Cl.² B21D *31/00*
U.S. Cl. 72—294 **17 Claims**



1. A method of providing an electrical contact with a tip portion substantially free of burrs wherein said contact is produced from an elongated strip of metallic material having a substantially uniform cross-sectional area, said method comprising:

positioning said metallic strip on a base member;

clamping said metallic strip positioned on said base member at a first location with a movable clamping member;

clamping said metallic strip at a second location substantially adjacent said first location with at least two clamping members pivoted about a common axis, each of said clamping members having first and second end portions located on opposing sides of said clamping members from said common pivot axis, said first end portions of each of said clamping members including a jaw portion for engaging said strip, said clamping achieved by engaging each of said second end portions of said clamping members with a movable engagement arm to provide separation thereof causing said jaw portions to engage said strip;

heating said metallic strip to an established temperature for a predetermined time period at a third location substantially between said first and second locations; and

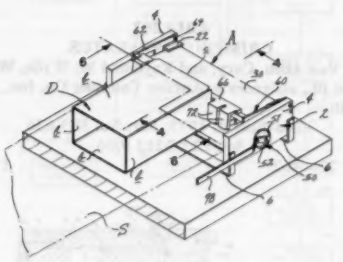
withdrawing said movable clamping members away from said base member to separate said first and second locations of said metallic strip a pre-established distance to elongate said heated third location and reduce the cross-sectional area thereof until said third location is completely severed, said severed third location defining said tip portion of said electrical contact.

4,014,200
CLEAT EDGE FORMING MACHINE

Oswald H. Wolters, Rte. 3, Sparta, Ill. 62286

Filed Oct. 24, 1975, Ser. No. 625,543
Int. Cl.² B21D *25/02*
U.S. Cl. 72—315 **24 Claims**

1. A machine for forming a reversely bent cleat edge on sheet metal, said machine comprising: a frame, an anvil supported on the frame, the anvil having free edge and being relatively thin in cross-section adjacent to the edge, the anvil providing a first surface against which the sheet metal is positioned with a portion projected over the free edge and also a second surface which is located on the opposite side thereof; a deforming beam supported on the frame and having a forward end located adjacent to the free edge of the anvil and a rear end located remote from the anvil, the beam being movable from an initial position to a final position, the beam when in the initial position having its forward end spaced from the free edge and first surface of the anvil so that the sheet metal when projected over the free edge will be generally between the free edge and the forward end of the beam, the beam when

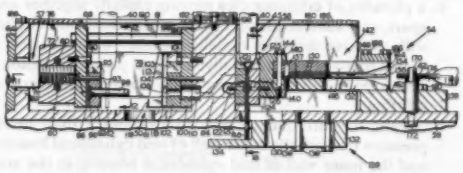


in its final position having its forward end located generally opposite the second surface of the anvil; and actuating means for moving the beam from its initial to its final position with the forward end being continually presented toward the anvil and the rear end being always located further from the anvil than the forward end, the actuating means moving the beam such that the beam movement is characterized by combined translation and rotation and such that the forward end of the beam passes by the free edge and then along the second surface of the anvil, whereby the portion of the sheet metal projected beyond the free edge of the anvil will be bent over the free edge and then reversely behind the anvil along the second surface thereof to form the cleat edge on the sheet metal.

4,014,201
APPARATUS AND METHOD FOR FORMING TRUSS TUBULAR WEB COMPONENTS HAVING FLAT SYMMETRICALLY BIFURCATED ENDS

Arthur L. Troutner; Clifford R. Johnson, both of Boise, and Stanley J. Willmorth, Eagle, all of Idaho, assignors to Trus Joist Corporation, Boise, Idaho

Filed Apr. 9, 1976, Ser. No. 675,494
Int. Cl.² B21D *28/00*
U.S. Cl. 72—332 **7 Claims**



1. An apparatus for forming a symmetrically bifurcated terminal portion on an existing truss web component having a tubular medial portion and flattened web ends defining medial coupling pin holes, comprising

a. a frame,

b. shearing and flattening means located on the frame and configured for shearing the tubing skin from the longitudinal margins of one of the web ends forming two unsupported side walls without flattening of the web ends, and sequentially thereafter flattening the just formed side walls,

c. splitting means located on the frame configured for indexing the unsupported side walls and separating them relative to one another forming a symmetrically bifurcated terminal portion, and

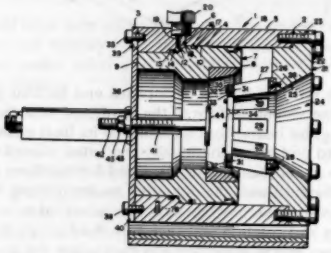
d. drive means operatively engaging the shearing means and the splitting means for the activation thereof.

4,014,202

CRIMPING APPARATUS

Richard Van Allen, Cary, and Raymond M. Wylie, Wildwood, both of Ill., assignors to Anchor Coupling Co. Inc., Libertyville, Ill.

Filed June 4, 1975, Ser. No. 583,636
Int. Cl.² B21J *9/06*
U.S. Cl. 72—402 **17 Claims**



1. Apparatus for crimping a fitting onto an elongated member comprising:

a. a cylindrical housing having forward and rear ends and inner and outer walls, said inner wall being offset inwardly at an intermediate point between said forward and rear ends,

b. a tubular piston in said cylindrical housing having forward and rear ends and inner and outer walls, said outer wall being offset outwardly complementally to the offset inner wall of said cylindrical housing and said piston being movable longitudinally in said housing from a retracted position in which said offset areas of (a) and (b) are adjacent one another to a forward position in which said offset area of (b) is moved forwardly with respect to the offset area of (a),

c. a plurality of crimping dies moving radially together and apart, said tubular piston having means associated therewith to move said dies radially together when the piston moves forward longitudinally, and said piston providing a central passageway to receive said elongated member and a fitting,

d. means for introducing and withdrawing a fluid under pressure through the outer wall of said cylindrical housing and the inner wall of said cylindrical housing in the area where said inner wall is offset inwardly so that said fluid will impinge on the offset portion of said outer wall of said piston and cause said piston to move forward longitudinally,

e. means for causing said piston to retract and return to its initial retracted position after it has moved forwardly and actuated said dies, and

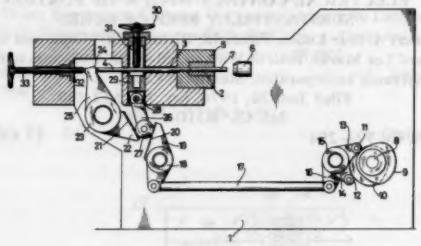
f. mounting means for said cylindrical housing, said apparatus having a detatchable stop plate connected to the rear end of said cylindrical housing extending in a plane which intersects the path of said elongated member and fitting when the latter are positioned between the crimping dies.

4,014,203

EJECTOR MECHANISM FOR EJECTING PRESSED PARTS FROM THE BOTTOM DIE OF PRESS

Friedrich-Karl Koch, and Hugo Schneiders, both of Krefeld, Germany, assignors to Peltzer & Ehlers, Krefeld, Germany

Filed June 20, 1975, Ser. No. 588,665
Int. Cl.² B21D *45/00*
U.S. Cl. 72—427 **3 Claims**



1. An ejector mechanism for ejecting pressed parts from the die of a machine having a frame, said mechanism comprising, in combination:

an ejector bolt slidable within the frame of the machine between an initial position and an eject position;

an ejector lever pivotally mounted on the machine frame and having a first arm that engages a rear end of said ejector bolt so as to cause the latter to slide from said initial position to said eject position when the lever is rocked in one direction, said ejector lever having a second arm with a generally radially extending planar surface provided thereon;

an intermediate lever pivotally mounted on the machine frame adjacent said ejector lever and rotatable within substantially the same plane as the ejector lever, said intermediate lever having a first arm extending alongside said second arm of the ejector lever and having a generally radially extending planar surface provided thereon on the side facing said planar surface on said second arm of the ejector lever, the planar surface on said first arm of said intermediate lever converging at an acute angle with the planar surface on said second arm of said ejector lever when said ejector bolt is in said initial position;

said intermediate lever also having a second arm projecting from the pivot axis;

a coupling rod connected to one end to said second arm of said intermediate lever;

cam means for reciprocating said coupling rod;

a slide member slidably mounted on the machine frame for movement toward or away from the converging planar surfaces;

roller means swingably suspended from said slide member, said roller means riding on both of said planar surfaces and serving to provide a movable pressure contact point between said first arm of said intermediate lever and said second arm of said ejector lever;

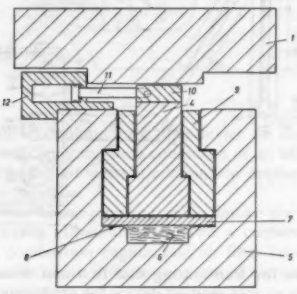
adjustable means engaging a back side of said first arm of the ejector lever; and

means on the frame of the machine for slidably adjusting the position of said slide member, thereby moving said roller means along said planar surfaces so as to increase the effective moment arm of one of the levers while decreasing the effective moment arm of the other lever.

4,014,204
MACHINE FOR PROCESSING METAL IN SHEET OR PLATE FORM

Eduard Alexander Hanni, Zofingen, and Vaclav Fraubisik Zbornik, Oftringen, both of Switzerland, assignors to Haemmerle, A.G., Zofingen, Switzerland

Filed May 27, 1975, Ser. No. 580,741
Claims priority, application Austria, May 27, 1974, 4330/74
Int. Cl.² B21D 5/01
U.S. Cl. 72—465 1 Claim



1. A machine for bending metal in sheet or plate form comprising:

a machine frame;

a table base on said frame having a cross section in the form of a U defining a confined oil-filled supporting space;

a ram vertically displaceable in relation to said table base;

an upper tool mounted on said ram;

a lower tool disposed on said table base;

said upper and lower tools cooperating for bending said metal sheet therebetween;

flexible supporting means for one of said tools comprising an elastic diaphragm and a plurality of individual elements thereover, side by side, in the U of said work table and in the confined oil-filled supporting space of said U section to provide an elastic and compliable supporting of the tool;

said plurality of individual elements being disposed tightly beside each other and each being independently displaceable in a vertical direction so that, in bending operation, only certain elements are displaced;

each of said individual elements comprising a lower part resting on said elastic diaphragm and an upper part resting on said lower part, said upper parts being adapted to support the tool and being independently displaceable in a horizontal direction from a working position where it rests on said lower part to a rest position where it is out of the path of movement of said lower part; and,

a plurality of piston-cylinder-units connected one to each of said upper parts of said individual elements by a connecting rod and being so connected to the piston so that an actuation of the piston of the piston-cylinder-unit removes said upper part from its position between said tool and said lower part.

4,014,205
ELECTRONIC CLOCK REGULATOR

Larry L. Wells, 7841 Austin Road, Jacksonville, Fla. 32210, and William G. Finkenbiner, 2137 W. Alabama, Houston, Tex. 77098

Filed May 17, 1976, Ser. No. 686,836
Int. Cl.² G04D 7/12
U.S. Cl. 73—6 10 Claims

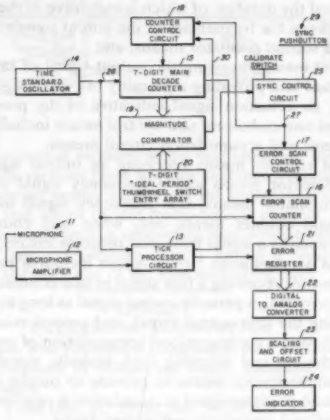
1. Apparatus for regulating the performance of mechanical or electromechanical clocks, comprising:

precision time pulse generating means;

means for preselecting a continuously variable ideal period of the clock being regulated and for providing a digital count representation thereof;

means for providing electrical pulse representations of acoustic ticks made by the clock being regulated;

means responsive to said acoustic tick pulses for counting said precision timing pulses to measure with precision the number of such timing pulses occurring between said



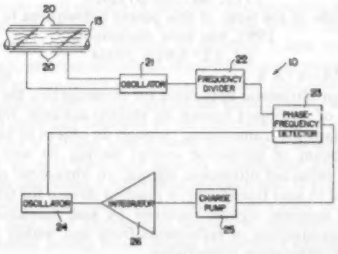
acoustic tick pulses to generate a count measurement of the actual period of the clock being regulated; and

means for comparing said count measurement with the count representation of said preselected ideal period to derive an error count measurement as a function of any time discrepancy between the actual measured period and the preselected ideal period of the clock being regulated.

4,014,206
APPARATUS AND METHOD FOR MONITORING AIR EMBOLI DURING EXTRACORPOREAL CIRCULATION

Bruce C. Taylor, Wayland, Mass., assignor to Akron City Hospital, Akron, Ohio

Filed Mar. 31, 1975, Ser. No. 563,856
Int. Cl.² G01N 27/22
U.S. Cl. 73—19 7 Claims



4. Apparatus for detecting at least one embolism contained in a fluid during extracorporeal circulation of the fluid in a tubing comprising:

means to monitor the electrical impedance of the tubing, fluid and any emboli contained therein having an output signal whose voltage is proportional to the electrical impedance of the tubing, fluid and any emboli contained therein,

first oscillator means receiving the output signal from said

means to monitor and providing at least one output signal whose frequency is proportional to the electrical impedance of the tubing, fluid and any emboli contained therein,

second oscillator means having an output signal whose frequency is proportional to the electrical impedance of the fluid and tubing,

detector means receiving the output signals from said first and second oscillator means and providing an output signal the duration of which is indicative of the difference between the frequencies of the output signals of said first and second oscillator means, and

control means receiving the output signal of said detector means and providing a plurality of output signals including an actuation signal indicative of the presence of at least one embolism, said control means including counter means and accumulation circuit means,

said counter means receiving an output signal of said detector means and a frequency signal of said first oscillator means, said frequency signal incrementing said counter means only when said counter means receives a signal from said detector means,

said accumulation circuit means including multivibrator means receiving a first signal of said counter means and providing a periodic output signal as long as it is receiving the first output signal, and second counter means having a predetermined accumulation of emboli stored therein and counting each periodic signal from said multivibrator means to provide an output signal when said predetermined accumulation is reached indicative of said predetermined accumulation,

said counter means providing a second signal being indicative of the presence of a single embolism of predetermined size, and

gate means receiving the output signal of said second counter means and said second signal from said counter means and selectively providing the actuation signal.

4,014,207

SECTOR SCANNING ULTRASONIC INSPECTION APPARATUS

Edward P. Meyer, Boulder, and William L. Wright, Longmont, both of Colo., assignors to Picker Electronics, Inc., Northford, Conn.

Division of Ser. No. 62,143, Aug. 7, 1970, Pat. No. 3,924,452, which is a continuation of Ser. No. 801,882, Oct. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 373,312, June 8, 1964, abandoned. This application Apr. 28, 1975, Ser. No. 572,058

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.² G01N *29/04*

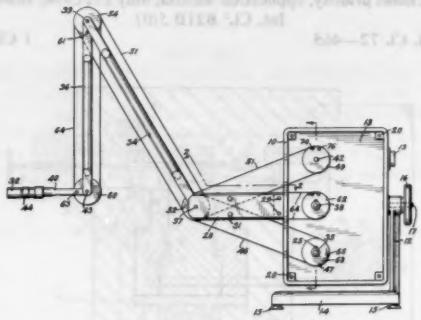
U.S. Cl. 73—67.8 S **10 Claims**

10. In an ultrasonic apparatus for investigating the internal structure of an object having an electro-acoustic transducer having a face for transmitting through an object to be investigated a beam of ultrasonic energy having an axis and for receiving reflected ultrasonic signals, an ultrasonic generator connected to said transducer, a readout device for translating reflected acoustic signals received by said transducer to a visible reproduction of reflections from and within such object, the combination comprising:

a. a base;

b. articulated arm structure comprising a plurality of joints and being connected to the base for constrainingly supporting the transducer for rocking movement for rotating the beam while constraining the beam axis substantially in a single plane while the transducer face is in contact with the surface of such subject;

c. signal generating means operatively associated with the articulated arm structure for producing first and second electrical signals respectively corresponding to direction of emission of said ultrasonic beam and to X and Y coordinate positions of said transducer, said signal generating means including a plurality of resolvers respectively associated with the plurality of joints, one resolver being for monitoring the rocking movement of said transducer for generating the first electrical signal; and



d. means for transmitting said first and second electrical signals to said readout device for producing a visual representation of the location of said transducer and of the direction of emission of said ultrasonic signals from said transducer means in said predetermined plane.

4,014,208

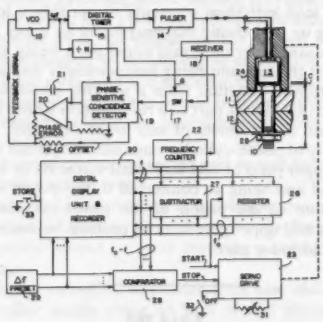
ULTRASONIC SYSTEM FOR MEASURING DIMENSIONAL OR STRESS CHANGE IN STRUCTURAL MEMBER

John F. Moore, Marina del Rey, and Forrest M. Coate, Hawthorne, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1976, Ser. No. 672,692

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.9 **18 Claims**

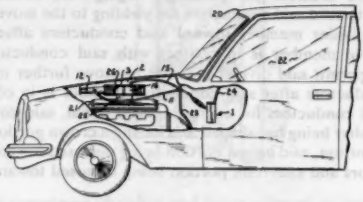


10. A method for measuring the ultrasonic transit time of a pulse through a structural member without regard to the transit time through coupling media comprising the steps of double pulsing an ultrasonic transducer coupled to a structural member at a pulse pair rate adjusted so that the second reflected echo of the first pulse of a pair coincides with the first reflected echo of the second pulse of the pair, whereby the pulse rate so adjusted is an accurate measure of the round trip transit time of an ultrasonic pulse through said member.

4,014,209
AIR FILTER CONDITION INDICATING DEVICE

Wayne L. Emerick, Rte. 20, Box 2006, Springfield, Mo. 64803

Filed Dec. 15, 1975, Ser. No. 641,692
Int. Cl.² G01N *15/00*; G01M *19/00*
U.S. Cl. 73—119 R 2 Claims



2. An air flow condition indicating device for continuously sensing and indicating the flow conditions of an air induction system and filter of an internal combustion engine and comprising in combination:

a. an air filter housing having an air intake portion and a central cavity communicating with a carburetor of an internal combustion engine, said air filter housing being positioned in an air induction system of an internal combustion engine;

b. a generally cylindrical air filter having an exterior surface and a central cavity therein, said air filter being positioned in said central cavity of said air filter housing and sealingly engaged therewith between the air intake portion and the communication with the carburetor;

c. a gauge housing mounted on an automobile dashboard in spaced relation with said air filter housing, said gauge housing having walls defining a chamber therein, one of said gauge housing walls having an observation aperture therein;

d. a tubular member positioned in said gauge housing and arranged to define a generally U-shaped path having a first leg and a second leg each having an upper end portion, said first leg of said tubular member having a transparent portion positioned adjacent and visible through said observation aperture in said gauge housing;

e. a colored liquid in said tubular member and positioned in said first and second legs;

f. indicia means positioned to be exposed and visible through said observation aperture in said guage housing upon movement of the colored liquid from said first leg of said tubular member;

g. first flow means having one end thereof connected to the upper end portion of said first leg of said tubular member and communicating between said air intake portion of said air filter housing and said tubular member first leg;

h. second flow means having one end thereof connected to the upper end portion of said second leg of said tubular member and communicating between said central cavity of said air filter and said tubular member second leg whereby reduced pressure in said air filter central cavity effects movement of the colored liquid in said tubular member first leg to expose said indicia means.

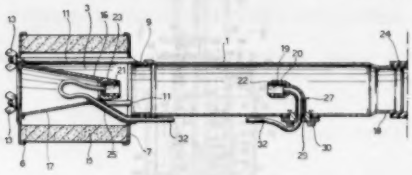
4,014,210
DEVICE FOR USE IN THE ULTRASONIC MEASUREMENT OF MASS FLOW OF GAS

Massimo Husse, and Mauro Lagonigro, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Apr. 8, 1976, Ser. No. 675,017
Claims priority, application Italy, Apr. 30, 1975, 68095/75
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A 3 Claims

1. Device for the ultrasonic measurement of the flow of gas, particularly the rate of flow of air in the induction duct of an internal combustion engine, of the type comprising a measurement duct, and respective upstream and downstream piezoelectric ultrasonic transducers mounted adjacent the ends of said measurement duct adapted to provide signals for measuring flow rate, wherein the improvement consists in:

– means defining a plenum chamber situated at the inlet end of the measurement duct;



– a frusto-conical element within said chamber, the vertex of which element faces towards said measurement duct,

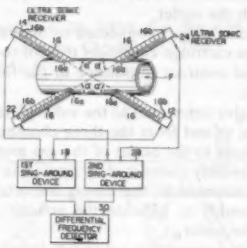
– an upstream seating supporting the upstream transducer at the said vertex of said frusto-conical element, and

– a downstream seating supporting said downstream transducer, said downstream seating having a tapered end facing the inlet end of the said measuring duct.

4,014,211
ULTRASONIC FLOW METER

Hitoshi Araki, and Yoshihioro Matsunaga, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,576
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A 4 Claims

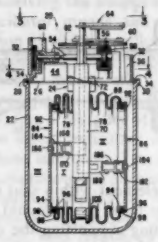


1. An ultrasonic flow meter device comprising a pipe through which a fluid the velocity of which is to be measured flows, first ultrasonic transmitter and receiver means disposed on the outer wall surface of said pipe and including a propagation path for an ultrasonic wave running within said fluid in the direction of flow thereof to produce a first sing-around frequency, second ultrasonic transmitter and receiver means disposed on the outer wall surface of said pipe and including a propagation path for an ultrasonic wave running within said fluid in a direction opposite to the direction of flow of the fluid to produce a second sing-around frequency, detector means coupled to said first and second transmitter and receiver means for detecting a difference between said first and second sing-around frequencies to measure a flow rate of the fluid, each of said first and second ultrasonic transmitter and receiver means having an ultrasonic transmitter element and an ultrasonic receiver element, a guide rod for each of said elements on one end of which the corresponding element is mounted, each guide rod having on the outer peripheral surface thereof a plurality of ridges for causing ultrasonic waves reflected from the ridged surface of said guide rod to cancel one another out, means securing the other end of each said guide rod to the outer wall surface of pipe, and a thin sheet of a metallic material selected from the group consisting of gold, platinum, gold alloys and platinum alloys between said other end of each guide rod and the outer wall surface of said pipe.

4,014,212
THREE-CHAMBER GAS METER

Robert Ritson Douglas, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,517
Int. Cl.² G01F 3/20
U.S. Cl. 73—267 7 Claims



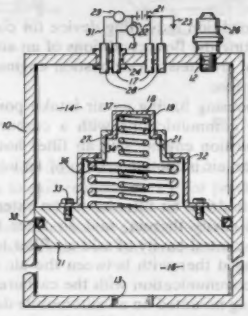
1. A three-chamber gas meter comprising:
a. a hollow casing having an open top,
b. a two chamber cartridge having a transverse valve plate detachably secured to enclose the casing top upon the cartridge being inserted into the casing to form a third chamber within the casing surrounding the two cartridge chambers,
c. a cover detachably secured to the casing over the valve plate to form an inlet chamber,
d. an inlet connected to the cover to communicate with the inlet chamber,
e. an outlet connected to the cover,
f. an outlet aperture formed in the valve plate in communication with the outlet,
g. a pair of diaphragms connected to the cartridge, one to each of the cartridge chambers thereof to independently expand and contract responsive to gas flow through the valve plate,
h. a rotary valve connected to the valve plate to control the flow of gas to and from the three chambers sequentially from the inlet to the outlet of the gas meter,
i. a crank assembly connected to rotate the rotary valve,
j. an index mounted in the casing and connected to the crank assembly to indicate the volume of gas flowing through the meter,
k. a pair of flag assemblies separately internally connected within the cartridge at one end thereof to one or the other of the diaphragms, and at the other end to actuate the crank assembly responsive to expansion and contraction of the diaphragms
l. a pair of flag rods journaled internally within the cartridge, one for each flag assembly, with each flag rod extending above the valve plate whereby the flag assemblies connect to the crank assembly within the inlet chamber.

4,014,213
ACCUMULATOR WARNING SYSTEM

Donald James Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 1, 1975, Ser. No. 636,688
Int. Cl.² G01F 23/18; B60T 11/10; F16L 55/04; H01H 35/34
U.S. Cl. 73—290 R 3 Claims

1. An accumulator warning system comprising a fluid container having fluid passageways at opposite ends thereof, a divider member movably and fluid-tightly disposed in said container for dividing said container into two compartments in fluid-flow communication with respective ones of said passageways, electric conductors disposed in one of said compartments and being spaced apart and disposed in the path of movement of said divider member, an electric system connected with said conductors and including an electric power source and an electric signal, an electrically conductive member movably mounted on said divider member and extending therefrom toward said conductors and having a span at least equal to the spacing between said conductors and being movable on said divider member in the direction of movement of said divider member, a spring operatively associated with said conductive member for yieldingly urging said conductive member toward said conductors for yielding to the movement of said divider member toward said conductors after said conductive member is in contact with said conductors to thereby permit said divider member to move further toward said conductors after said conductive member is in contact with said conductors for energizing said signal, said conductive member being hat-shaped and having a crown portion and a brim portion, said crown portion being disposed toward said conductors and said brim portion being disposed toward said



divider member, a flanged cylinder mounted on said divider member and having an end opening for telescopically receiving said crown portion and having a flange surrounding said end opening and being of a size smaller than the extent of said brim portion to overlap the latter and thereby movably restrain said conductive member relative to said divider member, an additional hat-shaped conductive member telescoped with and extending beyond and being smaller than the first said hat-shaped conductive member, additional said electric conductors disposed in said one compartment and spaced apart less than the spacing between the first said electric conductors and at a distance to match the span of said additional hat-shaped conductive member, a spring disposed to yieldingly urge said additional hat-shaped conductive member toward said additional conductors, and an additional electric signal connected to said additional conductors and to said electric system.

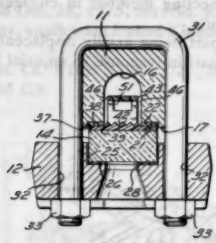
4,014,214
LIQUID LEVEL INDICATOR

Robert A. Pontefract, Chelmsford, Mass., assignor to Jerguson Gaga and Valve Company, Burlington, Mass.

Filed Jan. 19, 1976, Ser. No. 650,280
Int. Cl.² G01F 23/02
U.S. Cl. 73—330 8 Claims

1. A reflex glass assembly for a liquid level gauge comprising an elongated, transparent body, an inner face of said body having a plurality of parallel, longitudinally extending reflex prisms, a background element spaced inwardly of said inner body face, said background element displaying a high visual contrast to the characteristic reflex appearance of the reflex body at a nonwetted area thereof, and means extending between said background element and said body and supporting

said background element on said reflex body, said background element support means being adapted to be disposed within a



liquid-containing chamber and being adapted to support said background element independently of said chamber.

4,014,215

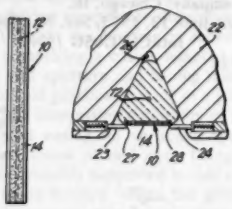
CLINICAL GLASS THERMOMETER HAVING A STEM AND A BULB INTEGRALLY FORMED THEREWITH

Seymour N. Blackman, 284 E. Palisades Ave., Englewood, N.J. 07603

Division of Ser. No. 453,324, March 21, 1974, Pat. No. 3,884,666, which is a continuation-in-part of Ser. No. 219,308, Jan. 20, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,325

Int. Cl.² G01K *5/02*

U.S. Cl. 73—371 **2 Claims**



1. A clinical glass thermometer having a stem of triangular cross-section, a capillary bore extending lengthwise within said stem, an opaque strip embedded within said stem and extending longitudinally thereof, and a bulb of circular cross-section, said bulb having side walls and a bottom wall formed integrally with said stem from a single piece of glass, a portion of said opaque strip extending into a side wall of said bulb, said portion of said strip in said side wall being a straight continuation of the balance of said strip in said stem, said side walls of said bulb having a thickness approximately equal to the thickness of said bottom wall, said side walls of said bulb joining said stem with no abrupt reduction of wall thickness.

4,014,216

APPARATUS FOR SAMPLING GAS MIXTURES

Joseph Scott Thornton, 5902 W. Bee Caves Road, Austin, Tex. 78746, and Edward Dale Golla, 5112 N. Lamar Blvd., Austin, Tex. 78751

Filed Mar. 22, 1976, Ser. No. 669,121

Int. Cl.² G01N *1/22*

U.S. Cl. 73—421.5 R **9 Claims**

1. A sampling system for taking gas samples, vapor and solid particulates therein which includes in combination:

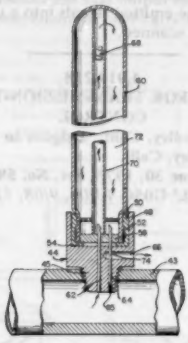
a gas sample container;

means to connect said sample container with a pressurized source of gas to be analyzed;

a filter section operatively connected to said pressurzied gas;

a flow measuring section operatively connected to said pressurized gas; and

means connecting the sample container to the rest of the system, said means comprising a plug adapted to connect



to said pressurized gas and having a minute passage through which gas to be sampled can flow into said sample container.

4,014,217

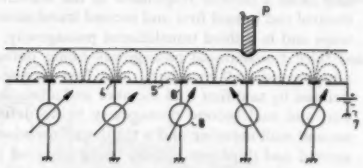
TACTILE PICK-UP

Jean Lagasse, Toulouse; Jean Clot, Saint-Orens de Gameville; Jean Falipou, Escalquens; Andre Loubieres, Ramonville Saint-Agne; Pierre Rabischong, Montpellier; Jean-Pierre Richard, Ramonville Saint-Agne, and Ai Bui, Toulouse, all of France, assignors to Agence Nationale de Valorisation de la Recherche Etablissement Public de Droit, Neuilly-sur-Seine, France

Filed Nov. 28, 1975, Ser. No. 635,956

Int. Cl.² H01C *10/10*

U.S. Cl. 73—432 R **10 Claims**



1. A tactile pick-up for contacting an object and emitting electric signals associated with the deformation caused by the object, said pick-up comprising:

a thin supple layer having a variable electrical conductivity as a function of its state of compression,

a matrix of electrodes comprising a large number of conductive measuring electrodes distributed on a side of said supple layer,

electricity supply means for producing in said supple layer a distribution of weak power currents which are repeated in a substantially identical manner straight above or below each said measuring electrode when said supple layer is at rest,

said supply means comprising an electrical source having a reference potential and conducting elements distributed on the same side of said supple layer as said measuring electrodes so as to imbricate with these without electrical contact,

said conductive elements comprising protective rings around said measuring electrodes and being connected to one terminal of said source thereby fixing them at a uniform potential,

a plurality of output lead means, each connected to a said measuring electrode for emitting an electric signal repre-

sentative of the electrical state of its said measuring electrode, and

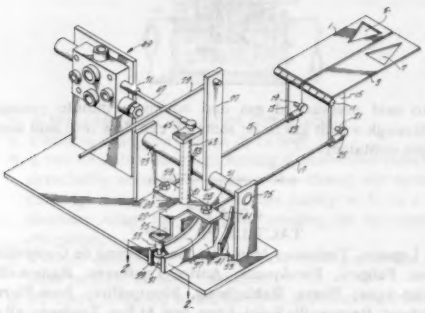
processing means connected to said output lead means for transforming the emitted signals into a unit of values that can be used or scanned.

4,014,218

APPARATUS FOR TRANSMISSION-THROTTLE CONTROL

Vernon Brandt, Reedley, Calif., assignor to Brandt Manufacturing Co., Reedley, Calif.

Filed June 30, 1975, Ser. No. 591,714
Int. Cl.² G05G *13/00, 9/08, 11/00*
U.S. Cl. 74—474 **6 Claims**



1. A transmission-throttle control apparatus comprising:

a swingable and rotatably moveable control rod;

a transmission control lever oppositely reciprocable from a neutral position to forward and reverse displacement positions coupled and responsive to the movement of said control rod in first and second translational passageways;

a throttle control lever oppositely reciprocalable to open and close a throttle responsive to the movement of said control rod in said first and second translational passageways and in a third translational passageway;

said third translational passageway being defined by first and second wall members, said first passageway being defined by said first wall member and a fourth wall member, and said second passageway being defined by said second wall member and a third wall member, said first, second and third passageway being adjacent said control rod and adopted to allow said control rod to traverse along the path of said passageways; and

linkage means coupling first and second control means to said control rod whereby actuation of said first control means causes said control rod to move along said first passsageway, actuation of said second control means causes said control rod to move along said second passageway and activation of both said first and second control means causes said control rod to move along third passageway.

4,014,219

STEERING SHAFT COUPLING

James R. Feustel, Ann Arbor, and Alex Rhodes, Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 10, 1975, Ser. No. 630,568
Int. Cl.² B62D *1/18;* **F16D** *1/02*
U.S. Cl. 74—492 **5 Claims**

1. A shaft coupling having a first coupling part, a second coupling part and an interconnecting member constructed to transmit torque from said first coupling part to said second coupling part;

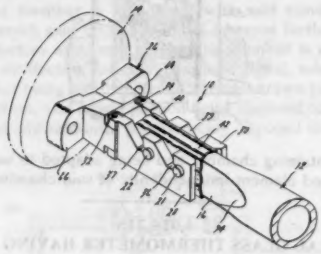
said first coupling part having abutment means;

said interconnecting member releasably engaging said abutment means of said first coupling part;

pivot means connecting said member to said second coupling part;

spring means exerting a spring force tending to maintain said interconnecting member in engagement with said abutment means;

said first shaft part being axially displaceable toward said second shaft part in response to an axial load;



said abutment means being disengageable from said interconnecting member in response to axial displacement of said first shaft part;

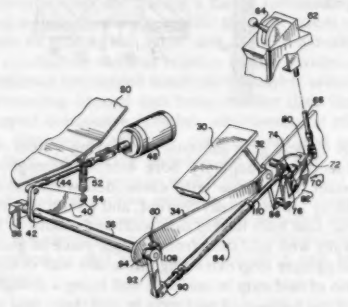
said spring means exerting a spring force tending to axially separate said first and second coupling parts.

4,014,220

TRACTIVE EFFORT SELECTOR

Norman J. Feigel, Libertyville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed June 13, 1975, Ser. No. 586,821
Int. Cl.² G05G *1/04*
U.S. Cl. 74—522 **7 Claims**



1. A tractive effort selector for use on a vehicle having a clutch control means capable of being controlled through a clutch linkage including a clutch engagement control pedal, a pedal rod, a first lever arm pivotally attached to the pedal rod, a transverse shaft, a first bell crank and a clutch controlling plunger rod comprising:

a tractive effort selector means;

a self-locking control head;

link means providing communication between said tractive effort selector means and said self-locking control head whereby movement of said selector means results in movement of said control head;

a tractive effort control bell crank having a first arm and a second arm;

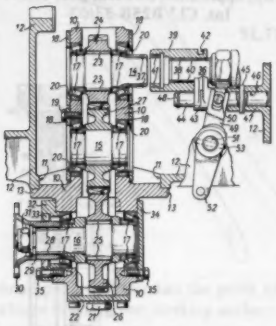
a spring loaded overtravel device linking said self-locking control head to said tractive effort control bell crank whereby movement of said control head results in movement of said bell crank;

a tab included in said clutch linkage positioned to interact with said second arm of said tractive effort control bell crank.

4,014,221
TRANSFER BOX FOR FOUR-WHEEL DRIVE VEHICLES

Thomas Eastwood, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England

Filed Oct. 28, 1975, Ser. No. 626,536
Claims priority, application United Kingdom, Dec. 18, 1974, 54584/74
Int. Cl.[2] F16H *37/06, 3/22, 57/00*
U.S. Cl. 74—665 GA 6 Claims



1. Transfer gearing for converting a vehicle with a single power-driven axle to four-wheel drive adapted for mounting upon and operative connection to a power actuated vehicle gearbox assembly that has a driven output shaft drive connected to one vehicle drive axle, said gearbox assembly comprising a housing having an aperture through which an end of said output shaft within the housing is accessible, and said transfer gearing comprising a casing adapted to be partially inserted through said aperture and having means whereby it may be secured to said gearbox housing in a partially inserted position, a gear train comprising a plurality of gears rotatably mounted within said casing on vertically spaced axes, the uppermost and lowermost of said gears being non-rotatably mounted on shafts rotatably supported in said casing, with the uppermost gear being located within the gearbox assembly housing and the lowermost gear being located externally of the gearbox assembly housing upon securing the partially inserted casing on the gearbox assembly, means on the shaft carrying said lowermost gear for coupling to another drive axle on the vehicle, and cooperating clutch means on said shaft carrying the uppermost gear and said end of the output shaft within the gearbox housing for selectively drive connecting said gear train to said output shaft for driving said other drive axle.

4,014,222
VARIABLE SPEED AND DIRECTION TRANSMISSION PRIME MOVER SYSTEM

James B. Brandt, P.O. Box 21, Sullivan, Wis. 53178

Filed Jan. 8, 1975, Ser. No. 539,276
Int. Cl.[2] F16H *47/04, 57/10*
U.S. Cl. 74—687 12 Claims

1. Power transmission apparatus adapted to transmit power between a source of power and an output element including:

first gear means operably connected to said source of power;

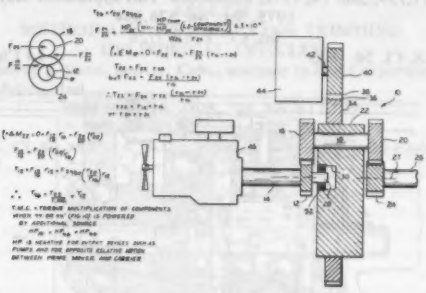
second gear means operable connected to said output element;

planetary gear carrier means operably disposed between said first and second gear means, said carrier mounted for rotation about its central axis;

shaft means associated with said planetary carrier;

planetary gear means connected to said shaft means and adapted for rotative movement in a circular path about said central axis of said planetary carrier as well as rotative motion about said shaft means;

control means associated with said planetary carrier means, said control means adapted to control rotative movement of said planetary carrier, whereby movement of said second gear means and said output shaft is determined by the rotative movement of said carrier and said first gear means;

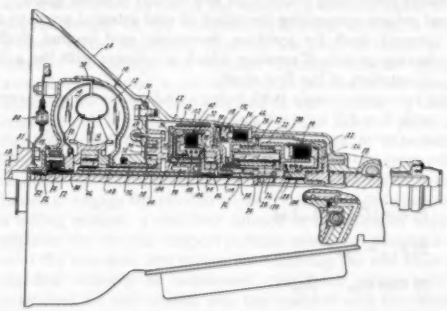


wherein said control means is adapted to alternatively hold said planetary carrier immobile or to rotate said planetary carrier about its central axis, whereby the speed and direction of said second gear means and said output shaft is determined by the speed and direction of rotation of said planetary carrier.

4,014,223
MULTIPLE RATIO HYDROKINETIC SPLIT TORQUE TRANSMISSION

Stanley L. Pierce, Jr., West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1975, Ser. No. 580,072
Int. Cl.[2] F16H *47/08;* F16D *33/00*
U.S. Cl. 74—688 8 Claims

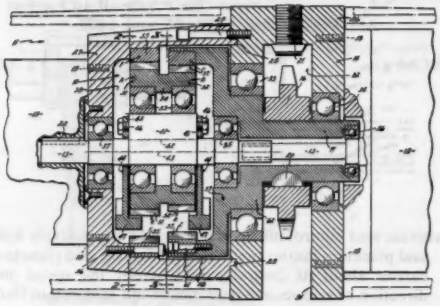


1. A multiple ratio hydrokinetic transmission mechanism comprising a planetary gear system having two torque input gear elements, a torque output element and a reaction element, brake means for anchoring the reaction element to effect forward drive operation in a first and second forward drive ratio, a hydrokinetic unit comprising an impeller and a turbine, the impeller being connected to a source of torque, a turbine shaft and a torque splitter planetary gear unit having an input element connected to a source of torque, a second element connected to the turbine shaft and a third element cooperating with the first and second elements to effect a torque balance, first clutch means for connecting the turbine shaft to a first of said torque input gear elements of said planetary gear system and second clutch means for selectively connecting said third element of said torque splitter gear unit to the said second of said torque input gear elements.

4,014,224
SPEED DIFFERENTIAL PLANETARY GEAR TRAIN

Dallas L. Pitts, Wynne, Ark., assignor to Pitts Drive, Inc., Wynne, Ark.

Continuation-in-part of Ser. No. 405,753, Oct. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 217,739, Jan. 14, 1972, abandoned. This application May 12, 1975, Ser. No. 576,284
Int. Cl.² F16H 1/28
U.S. Cl. 74—805 14 Claims



1. A speed differential planetary gear train comprising,
a first rotatable shaft connected to an eccentric for rotation therewith, the eccentric rotating about the axis of the first shaft.
a two gear cluster comprising a first external gear and a second external gear, said cluster being journaled on said eccentric for rotation about the axis of the eccentric,
said first external gear meshing and rotating within a first internal gear disposed around it, thereby forming a first gear system,
said second external gear meshing and rotating within a second internal gear disposed around it, thereby forming a second gear system,
means preventing rotation of one of said internal gears,
and means connecting the other of said internal gears to a second shaft for rotation therewith, said second shaft having an axis of rotation which is colinear with the axis of rotation of the first shaft,
the two said systems both being standard involute systems with $N = PD$ for each gear,
said external gears having different numbers of teeth,
the gears of the said train being further related substantially in accordance with the following equations:

1) $E = (D_{int} - D_{ext})/2$

2) $F_{F,A} = E_{B,C}$

3) $0.84\ D_{int} \quad D_{ext}$

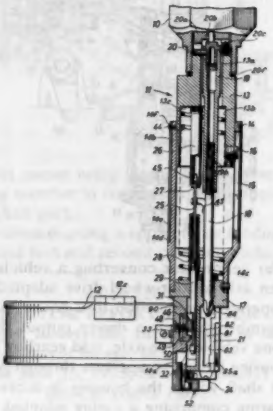
4) $$\text{speed ratio} = \frac{1}{1 - \left(1 - \frac{2E}{D_C}\right)\left(1 + \frac{2E}{D_A}\right)}$$

wherein
N is an integer equal to the number of teeth on the respective gear;
P is the diametral pitch of the respective gear;
D is the gear diameter;
E is the offset between the center of the eccentric and the axis about which the eccentric rotates;
the non-rotating internal gear is designated as F;
the external gear which meshes with the non-rotating internal gear is designated as A;
the other external gear is designated as B;
and the other internal gear is designated as C.

4,014,225
POWER-DRIVEN SCREWDRIVER

Sixten H. Lejdegård, Ramnas, and Nils E. Henriksson, Hallstahammar, both of Sweden, assignors to Bulten-Kanthal Aktiebolag, Sweden

Continuation-in-part of Ser. No. 438,720, Feb. 1, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,287
Claims priority, application Sweden, Feb. 2, 1973, 7301423
Int. Cl.² B25B 23/02
U.S. Cl. 81—57.37 41 Claims



1. A power-driven screwdriver for use with an assemblage of screws affixed to a strip-like screw-carrying medium, comprising:
a. a body engageable with a workpiece;
b. a screwdriver bit mounted in said body for rotational and axial movement therein, and having drive means by which said bit may be rotatably driven;
c. stationary guide means on said body for guiding an end portion of the assemblage of screws remotely from the axis of said bit such that the next-to-be driven screw is guided and supported only by the strip-like medium in registration with said bit to be detached therefrom and driven into the workpiece by said bit; and
d. automatic index means on said body for normally holding said end portion of the assemblage of screws against movement in either direction in said guide means, and operative on the screw-carrying medium to apply an indexing force thereto, only after and under the control of the axial retractive movement of the bit, for the distance needed to advance the next of the screws into said registration.

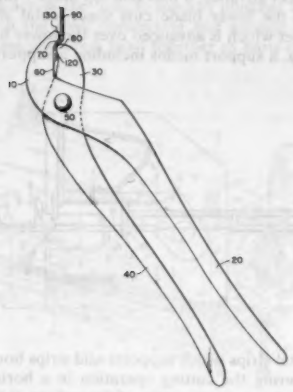
4,014,226
PLIERS WITH MODIFIED JAWS FOR USE IN AUTO BODY REPAIR

John Karamarkovich, Pittsburgh, Pa., assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 4, 1976, Ser. No. 683,017
Int. Cl.² B25B 7/02
U.S. Cl. 81—426 3 Claims

1. A pair of pliers with specially shaped jaws designed for indenting sheet metal comprising a conventional pair of pliers with elongated handles and first and second opposed jaws pivotally secured together so that squeezing the handles together causes the jaws to be squeezed together, the first jaw having an inner working surface with a first flat section and a shorter second flat working section that is attached to the

front of the first section and makes an obtuse angle with respect to it, and the second jaw having an inwardly extending



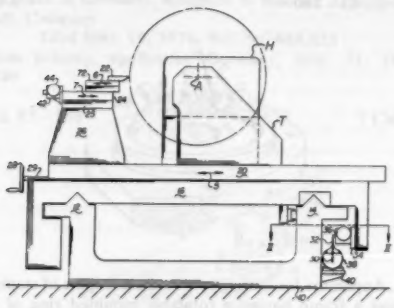
sharply defined peak that touches the point of connection of the two sections of the inner working surface when the jaws are closed.

4,014,227

WIRE GUIDED ROLL CROWNING ATTACHMENT FOR LATHES

Richard J. Adams, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 19, 1976, Ser. No. 668,684
Int. Cl.² B23B *3/00*
U.S. Cl. 82—1 R **18 Claims**



1. Apparatus for compensating for lateral deviations in the straightness of a longitudinally extending bed of a machine tool, which includes a carriage mounted on the bed for travel axially therealong and a toolholding tool slide for movement perpendicular to the direction of the carriage travel, comprising, in combination:

a wire means mounted to coextend parallel to the direction of travel of the carriage on the bed;

motor means mounted to effect relative movement between the tool and carriage;

sensor means mounted on the machine tool and arranged in horizontally spaced adjacency relative to the wire means;

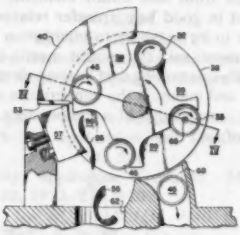
control means for reciprocating the sensor means and tool, including means for signaling the motor means to (a) initially move the sensor means toward the wire means at a predetermined rate and, (b) to move the tool away from the center of the bed at a corresponding equal rate until the sensor means is activated by its proximity to the wire means whereupon the control means reverses the motor means to move the sensor means and the tool toward center of the bed at a predetermined rate to complete a cycle whereby the tool movement has been compensated for any lateral deviations in the straightness of the bed.

4,014,228

METHOD AND APPARATUS FOR TRIMMING CYLINDRICAL ARTICLES

Geoffrey J. Dean, Denver, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Sept. 10, 1975, Ser. No. 612,159
Int. Cl.² B23B *1/00, 37/00, 3/04*
U.S. Cl. 82—47 **22 Claims**



1. Apparatus for trimming cylindrical articles to a predetermined length comprising: at least one cylindrical mandrel having an axis and extending from a rotatable mandrel support for rotation around an axis spaced from the axis of the mandrel a greater distance than the mandrel diameter, the mandrel further being journalled to the mandrel support for rotation around its own axis, means for rotating the mandrel and mandrel support around the spaced axis at a given rate and for rotating the mandrel around its own axis with a peripheral velocity speed equal in magnitude and opposite in sense to that produced by rotation around the spaced axis, a circular cutting member defined circumferentially around the mandrel and spaced from an end of the mandrel a distance equal to the desired length of the trimmed cylindrical article, a fixed, arcuate blade positioned adjacent the path of travel of the mandrel to engage the circular cutting member defined around the mandrel, a circular support portion of the mandrel adjacent the cutting edge defined in the mandrel, a cutting edge defined longitudinally in the circular support portion, a fixed splitting blade disposed perpendicular to the arcuate blade and adapted to engage the cutting edge, a support shoe adjacent the splitting blade having an arcuate surface positioned to engage the circular support portion of the mandrel in a rolling motion, a chamber defined in the mandrel support adjacent the circular support portion, means for placing a can onto the mandrel, and means for removing the can from the mandrel whereby an untrimmed cylindrical article may be positioned on and rotated with the mandrel with the circular cutting member defined in the mandrel engaging the fixed arcuate blade to shear an annulus from the article, the fixed splitting blade in conjunction with the cutting edge severing the annulus into a strip and the circular support portion engaging and rolling the strip against the support shoe as the mandrel rotates to deposit the rolled, straight strip in the chamber for conveyance to a depository for the strip, and the trimmed cylindrical article then being removed from the mandrel.

4,014,229

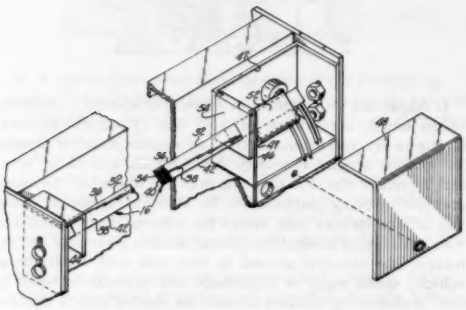
FILM DISPENSER AND CUTOFF

William C. Lynch, Brecksville, Ohio, assignor to Clamco Corporation, Cleveland, Ohio

Filed Mar. 21, 1975, Ser. No. 560,814
Int. Cl.² B26D *7/10*
U.S. Cl. 83—16 **14 Claims**

1. Apparatus for severing sheets of film from a roll of plastic

film, said apparatus comprising a cutoff element for severing the film when the film is moved against the cutoff element under tension and a pressure established between the cutoff element and the film, said cutoff element including means defining diverging walls extending at acute angles with respect to the plane of the film as the film is moved thereagainst and defining a corner edge for engaging the film to be severed and for concentrating stresses applied to the film substantially along a line of severance, said cutoff element being made of sheet metal having high heat conductivity, an elongated electric heating unit extending substantially the length of said cutoff element and disposed between said wall portions to effect a heating of said cutoff element including said corner edge, means for electrically insulating said elongated electrical heating unit from said cutoff element, and thermostat means disposed in good heat transfer relationship with said cutoff element to be sensitive to changes in temperature of said cutoff element, said thermostat means including means for automatically controlling said heating element to heat said cutoff element and maintain the temperature of said diverging walls and said corner edge at a temperature lower than the melting point of said film.



14. A method of severing polyvinyl chloride film comprising the steps of providing a cutoff element having wall portions defining a corner edge, bringing the plane of the film to be severed into engagement with the cutoff element with the wall portions disposed at acute angles with respect to the plane of the film to concentrate stresses applied to the film substantially along a line of severance, heating the cutoff element by applying electrical power to an electrical heating unit disposed in heat transferable and electrically insulated relationship with said cutoff element, sensing the temperature of the cutoff element with a temperature sensing device which is in heat transferable relationship with said cutoff element and automatically reducing the application of electrical power to the heating unit in response to the temperature of the cutoff element when the temperature sensed by the temperature sensing device reaches about 260°, automatically controlling application of electrical power to the heating element to heat the cutoff element in response to the temperature of the sensing element when the temperature of the cutoff element is below a predetermined minimum temperature which is below 260°, the application of electrical power to said heating unit being capable of heating the electrical heating element to a temperature considerably about 260°.

4,014,230

SHEET METAL SHEARS FOR METAL SHEETS AND PLATES WITH A HIGHLY SENSITIVE SURFACE

Franz Eisele, Kuchen, Germany, assignor to Wurttembergische Metallwarenfabrik, Geislingen, Germany

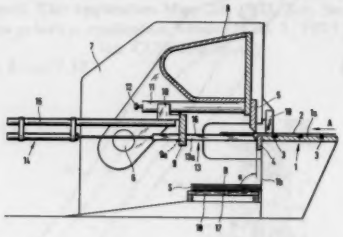
Filed Dec. 11, 1975, Ser. No. 639,965

Claims priority, application Germany, Dec. 11, 1974, 2458655

Int. Cl.² B26D *7/06*

U.S. Cl. 83—86 **7 Claims**

1. Sheet metal shears for metal sheets and plates with a highly sensitive surface comprising: a sheet metal infeed platen with a lower blade secured to the edge thereof extending transversely to the direction of sheet advance, a sheet stop disposed in spaced relation from the lower blade in the direction of sheet advance, a movable top blade which in cooperation with the lower blade cuts sheet metal strips from the metal sheet which is advanced over the lower blade up to the sheet stop, a support means including a support table for the



sheet metal strips which supports said strips horizontally prior to and during the cutting operation in a horizontal support plane which is a continuation of the surface of the sheet metal infeed platen, and said support means further including drive means for reciprocating said support table horizontally in said horizontal support plane into and out of the space between said lower blade and said sheet stop.

4,014,231

METHOD AND APPARATUS FOR CUTTING TOW

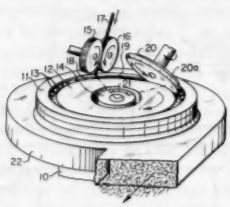
Frits Hutzezon, Arnhem, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Dec. 4, 1975, Ser. No. 637,806

Claims priority, application Netherlands, Dec. 6, 1974, 7415905

Int. Cl.² D01G *1/04*

U.S. Cl. 83—100 **9 Claims**



1. Apparatus for cutting tow in short lengths of staple comprising a frame having a rotatably mounted ring of blades spaced apart a determined distance, the cutting edges of said blades facing inwardly and uniformly forming a selected angle with the axis of rotation of the ring of blades; a rotatably mounted pressure roll having an axis of rotation intersecting the axis of rotation of said ring of blades, and an outer surface of rotation parallel and adjacent to but a fixed determined distance away from the cutting edges of said blades; means for feeding said tow from a supply source to between said cutting edges and pressure roll; and means for rotating said ring of blades.

4,014,232

DIE-SET ASSEMBLY

David W. Mauger, Thiensville, Wis., assignor to Clevepak Corporation, New York, N.Y.

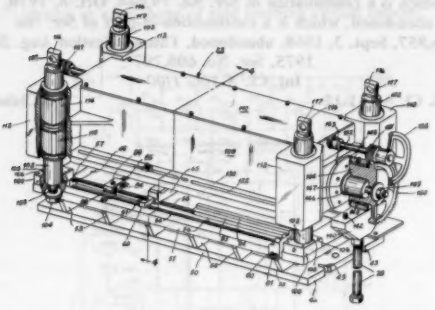
Filed Oct. 31, 1974, Ser. No. 519,671

Int. Cl.² B26D *7/18, 5/08*

U.S. Cl. 83—144 **12 Claims**

1. In a unitary punch and die unit separable as a unit from and adapted to be mounted on a machine on which machine

there is power operated drive means, the separable unit comprising: a base; die-holding means extending across the base to support dies in different selected positions across the base; a press head overlying the base and having punch holding means also extending across the base to support punches adjustably to register with the dies; connecting and guiding means to connect the base and press head together as parts of the unit



for movement toward and from each other to enable a punching operation to be performed; means in the unit for selectively moving the press head toward and from the base; means on the press head for connection with the power operated drive means for moving the press head when the unit is mounted onto the machine, the said means for connecting being readily disconnectable; and connecting parts for use in quickly mounting the unit onto a machine.

4,014,233
APPARATUS FOR SEVERING A SHEET OF MATERIAL FROM A WEB

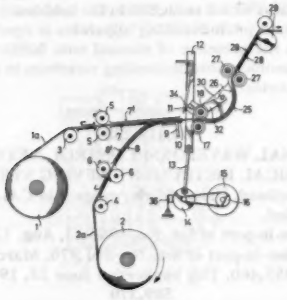
Arthur Wölfinger, Wiesbaden, and Klaus Nicolay, Massenheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 19, 1976, Ser. No. 668,621

Claims priority, application Germany, Mar. 21, 1975, 2512540

Int. Cl.² B26D 7/14

U.S. Cl. 83—156 **7 Claims**



1. In an apparatus for cutting a sheet from a web of material, including a magazine roll for the web of material, a cutting station, at least one feeding device for the web upstream of the cutting station and which is stationary during a cutting operation, a feeding device downstream of the cutting station and which is in operation during a cutting operation, movable curved guide means between the cutting station and the downstream feeding device, which guide means provides a shorter path for the web of material between the cutting station and the feeding device downstream thereof during the cutting operation,

the improvement comprising separate drive means for the movable curved guide means,

additional feeding means for the web including at least one rotary element means positioned between the cutting station and the movable guide means, said rotary element means being adapted to rest against a web of material with a frictional force lower than that of the other feeding devices,

and means adapted to drive said rotary element means at a circumferential speed exceeding the speed of the web of material.

4,014,234
CUTTING APPARATUS

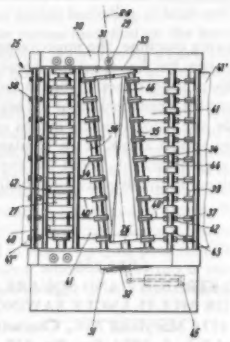
Ernst M. Spengler, Heusenstamm, Germany, assignor to Stanztechnik GmbH Roeder & Spengler, Bergen-Enkheim, Germany

Continuation-in-part of Ser. No. 338,342, March 5, 1973, Pat. No. 3,859,879. This application Nov. 13, 1974, Ser. No. 523,546

Claims priority, application Germany, Mar. 8, 1972, 2211118; Nov. 20, 1973, 2357820

Int. Cl.² B26D 1/36, 1/40

U.S. Cl. 83—162 **25 Claims**

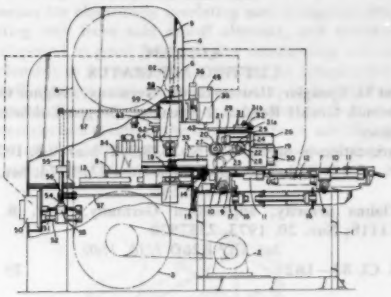


1. In an apparatus for cutting sheet material advancing in a given direction, including a frame structure, a cutting roller for cutting the sheet material substantially across said advancing direction and a counter pressure roller, each roller having a rotational axis and an outer surface, means rotatably supporting both of said rollers in said frame structure for cooperation with each other, strip steel knife means, means securing said strip steel knife means to said cutting roller, whereby said strip steel knife means extend substantially radially away from said cutting roller, said strip steel knife means following a helix around the cutting roller which extends with its longitudinal axis at an angle (α) relative to a line extending perpendicularly to said given direction, said angle (α) compensating for the fact that the strip steel knife means follow a helix, the improvement wherein, said securing means comprise a plurality of individual holding blocks releasably secured in holes in the outer surface of said cutting roller, and means releasably holding said strip steel knife means in each of said holding blocks, in which holes said holding blocks are rotatable in their released condition for adjusting the knife position, each hole having a radially extending axis which extends in the plane of said strip steel knife means when the latter are secured to the cutting roller, said apparatus further comprising journal means having a journal axis held in said frame structure, said cutting roller having frame means secured to said journal means for tilting said cutting roller about said journal axis extending substantially perpendicularly to the rotational axis of said cutting roller.

4,014,235
APPARATUS FOR BANDSAWING OPERATION WITH PROFILING MECHANISM CAPABLE OF AUTOMATIC COPYING OF A MODEL

Toshihiro Fukami, Toyohashi, Japan, assignor to Fukami Co., Ltd., Toyohashi, Japan

Division of Ser. No. 367,568, June 6, 1973, Pat. No. 3,882,742. This application Mar. 10, 1975, Ser. No. 556,778
Claims priority, application Japan, June 15, 1972, 47-059873
Int. Cl.² B26D *1/54*
U.S. Cl. 83—565 13 Claims

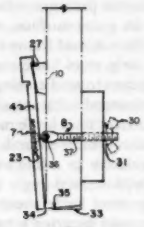


1. In a bandsawing machine, the improvement comprising a profiling mechanism having a profile sensing member for sensing the profile of a work model, means for converting into an electrical signal the displacement of the sensing member by the model profile, the blade-twisting means responsive to the signal for twisting a short length of the bandsaw blade, including the cutting region thereof, about the cutting edge by an amount proportional to the displacement of the sensing member.

4,014,236
PORTABLE, STRAIGHT AND SQUARE, VARIABLE ANGLE OR MULTI-ANGLE SAWING GUIDE

Edwin S. Neal, 1514 Maryland Ave., Charlotte, N.C. 28209

Filed Feb. 8, 1974, Ser. No. 435,527
Int. Cl.² B27B *9/04*
U.S. Cl. 83—745 7 Claims

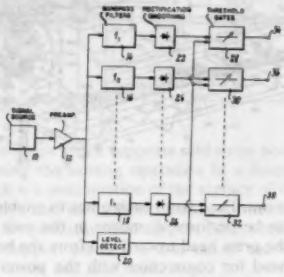


1. A sawing guide for guiding a circular saw having a flat base plate during the sawing of an object comprising guide plate means for engaging said circular saw to control the line of cut and angle of cut made by the saw, angle controlling means adapted to engage said object and extend between said object and said guide plate means, and mounting means to secure said guide plate means to said object and to maintain said guide plate means in contact with said object, said mounting means being adapted to allow pivotal movement of said guide plate means relative to said object to maintain a first portion of said guide plate means in contact with said object while permitting said angle controlling means to vary the distance between a second portion of said guide plate means and said object.

4,014,237
MUSICAL NOTE DETECTING APPARATUS

Karl F. Milde, Jr., 198 Baltic St., Brooklyn, N.Y. 11201

Continuation of Ser. No. 231,016, March 1, 1972, abandoned, which is a continuation of Ser. No. 79,044, Oct. 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,857, Sept. 3, 1968, abandoned. This application Aug. 28, 1975, Ser. No. 608,707
Int. Cl.² G10G *1/00*
U.S. Cl. 84—1.12 8 Claims



1. In apparatus for automatically detecting the pitch of individual notes of music comprising input means for receiving an electrical signal representing said music in analog form; frequency detecting means, coupled to said input means, for detecting the presence of musical note frequencies in said electrical signal; and musical note determining means, coupled to said frequency detecting means, for determining the notes of said music represented in said electrical signal in response to presence of said frequencies; said pitch-detecting apparatus having a sensitivity of detection such that the determination of the presence of a note is dependent upon the strength of said electrical signal; the improvement wherein said pitch-detecting apparatus further comprises means, coupled to said input means, for varying the sensitivity of said pitch-detecting apparatus in inverse relation to the strength of said signal, thereby reducing the sensitivity of the apparatus with an increase in the loudness and increasing the sensitivity of the apparatus with a reduction in the loudness of said notes;

whereby said pitch-detecting apparatus is operative to determine the presence of musical note fundamentals, but not harmonics, notwithstanding variations in the loudness of said notes.

4,014,238
TONE SIGNAL WAVEFORM CONTROL NETWORK FOR MUSICAL INSTRUMENT KEYING SYSTEM

James S. Southard, Union, Mich., assignor to C.G. Conn, Ltd., Elkhart, Ind.

Continuation-in-part of Ser. No. 496,943, Aug. 13, 1974, and a continuation-in-part of Ser. No. 561,970, March 26, 1975, Pat. No. 3,955,460. This application June 23, 1975, Ser. No. 589,370
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.13 13 Claims

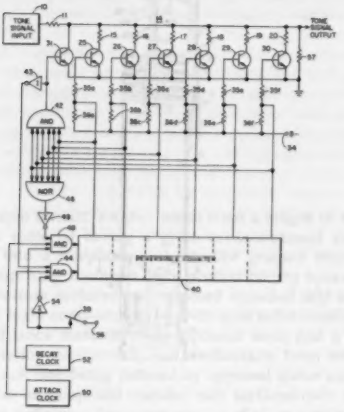
1. A keying system for shaping tone signals in an electronic musical instrument in which key operation information is digitally multiplexed data, said system including in combination:

latching circuit means coupled to receive said multiplexed data and having a predetermined number of stages, said latching circuit means responsive to the application of a strobe pulse to each stage thereof to store in such stage the data received thereby at the time of application of such strobe pulse;

means for applying strobe pulses to the stages of said latching circuit means;

an attenuator matrix including a plurality of variable attenuator networks corresponding to the number of stages of said latching circuit means;

scanning circuit means coupled with the outputs of each stage of said latching circuit means for sequentially producing signals representative of the state of the data stored in each stage of said latching circuit means;



a tone signal input terminal for receiving tone input signals coupled with each variable attenuator network;

a tone signal output terminal coupled with each variable attenuator network for supplying tone signals therefrom; and

control circuit means coupled with said scanning circuit means and with said attenuator matrix for controlling the operation of each of said variable attenuator networks according to the output signals from said scanning circuit means.

4,014,239

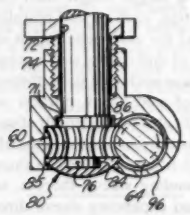
GUITAR STRING TUNING DEVICE

Robert J. Spercel, 3214 W. 139th St., Cleveland, Ohio 44120

Filed Mar. 12, 1975, Ser. No. 557,817

Int. Cl.² G10D *3/14*

U.S. Cl. 84—306 **29 Claims**



1. A device for use in tuning the strings of a stringed musical instrument, said device comprising a rotatable shaft adapted to be connected with a string of the musical instrument, a pinion gear connected with said shaft for rotation therewith about a common central axis, a rotatable worm gear disposed in meshing engagement with said pinion gear, fixed surface means disposed in a predetermined position relative to the central axis of said worm gear for rotatably supporting one side portion of said pinion gear, movable surface means for rotatably supporting another side portion of said pinion gear, means for rotating said worm gear about its central axis to effect rotation of said pinion gear and shaft about their common central axis, and adjustment means for moving said movable surface means relative to said fixed surface means to move said pinion gear and vary the meshing relationship between said pinion and worm gears.

4,014,240

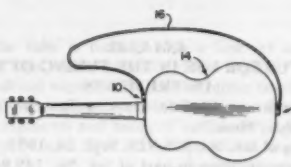
STRAP HOLDER ASSEMBLY

Charles E. Pullen, Pebble Hill Plantation, Thomasville, Ga. 31792

Filed Dec. 17, 1975, Ser. No. 641,520

Int. Cl.² G10D *3/00;* **G10G** *5/00*

U.S. Cl. 84—327 **10 Claims**



1. A strap holder means of the type primarily used for attachment of a strap to a musical instrument or like device, said strap holder means including at least one holder assembly comprising: base means mounted on the instrument and comprising an upstanding flange having a curvilinear configuration along at least a portion of the length thereof, said flange extending outwardly relative to the surface of the instrument, socket means defined substantially on the interior of said base means, swivel means movably connected to said base means, said swivel means movably mounted within said socket means in substantially surrounded relation relative to said flange, said swivel means including a strap connector element attached thereto and extending substantially outwardly from said base means, said strap connector element including attachment means disposed in strap engaging position relative to said strap connector element, whereby the strap is movably connected to the instrument at least at one end thereof.

4,014,241

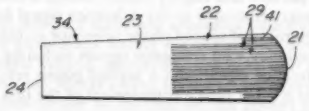
SYNTHETIC WOODWIND REED

George W. Gamble, One Phlox Lane, Acton, Mass. 01720

Filed Feb. 11, 1976, Ser. No. 657,077

Int. Cl.² G10D *9/02*

U.S. Cl. 84—383 A **11 Claims**



1. A reed for a woodwind instrument comprising a strip of material having a non-convex surface, a convex surface curved in the transverse direction, a tip end, and a root end, said non-convex surface and said convex surface forming a vamp region and a root region, said vamp region extending from the tip end to some distance between the tip end and root end, the inter-surface distance between said convex surface and said non-convex surface increasing exponentially as a function of longitudinal distance from said tip end for the length of said vamp region, said convex surface having a first set of longitudinal channels therein extending from said tip end along at least a portion of said vamp region, said non-convex surface having a second set of longitudinal channels therein aligned with said first set of channels and extending

from said tip end along at least a portion of said vamp region, whereby any transverse cross-section of at least that portion of the vamp region near said tip end comprises a pluraility of alternating thicker and thinner regions, said thinner regions being near but not necessarily on the center of gravity of the cross-section.

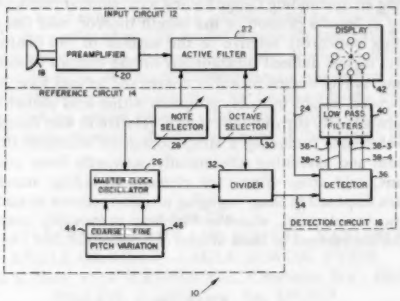
4,014,242
APPARATUS FOR USE IN THE TUNING OF MUSICAL INSTRUMENTS

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Continuation of Ser. No. 399,923, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,942, May 3, 1972, abandoned. This application May 22, 1975, Ser. No. 579,946

Int. Cl.[2] G10G *7/02*

U.S. Cl. 84—454 **24 Claims**



1. A tuning aid for musical instruments comprising:

A. an input circuit with means for detecting an audio signal in a selected range of frequencies and generating a note signal;

B. a reference circuit for transmitting a reference signal; and

C. comparison and display circuit means including:

i. means responsive to the reference signal for producing a plurality of spaced phase reference signals at a known frequency, said reference signals including a first phase reference signal, and a second phase reference signal that is other than a complement of the first phase reference signal,

ii. a phase difference detector including a logical combination means connected to receive each phase reference signal, each of said logical combination means combining the note signal and corresponding phase reference signal for transmitting a logical output signal which has a duty cycle that varies in accordance with the phase relationship between the note signal and the corresponding phase reference signal, and

iii. a plurality of display means, each display means responsive to one of the output signals for displaying the phase relationship between the note signal and the corresponding one of the phase reference signals, said plurality of display means providing a continuous display of the direction of and rate of the note signal phase change.

4,014,243
EXPANDING BOLT

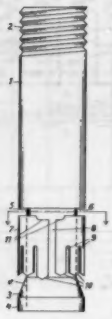
Illar Toomingas, Enskede, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 28, 1975, Ser. No. 635,927

Claims priority, application Sweden, Dec. 11, 1974, 7415535

Int. Cl.[2] F16B *13/04*

U.S. Cl. 85—74 **2 Claims**



1. An expanding bolt for attachment to the walls of a cavity, comprising: a shank portion having a threaded outer end for the receiption thereabout of a nut for tightening; an inner end formed as a cone coaxial with said outer end, said cone having a narrow part directed toward said outer end; a cylindrical transition portion between said cone and said shank portion having a diameter less than said shank portion; and an expanding sleeve surrounding said cylindrical transition portion, said expanding sleeve having an axial slit formed along the length thereof for facilitating the expansion thereof, a continuous edge directed toward said outer end of said shank portion, a plurality of slots formed about the circumference of said expanding sleeve, each slot extending from the edge directed toward said inner end toward said continuous edge directed toward said outer end, and a plurality of straight tips formed between said plurality of slots, some of said plurality of straight tips having a length longer than other ones of said plurality of straight tips, each of said plurality of straight tips having a pointed end for easy penetration of said expanding sleeve into the walls of said cavity; said expanding sleve having a circumferential shape such that parts thereof extend beyond the circumference of said shank portion as measured in a plane taken perpendicular to the length of said shank portion, so that said parts thereof contact the walls of said cavity upon insertion of said bolt into said cavity to thereby afford initial holding of the expanding sleeve therein, said edge of said circumference of said expanding sleeve directed toward said outer end comprising a plurality of notches extending partly along the length of said expanding sleeve toward said inner end so that material rubbed off from said expanding sleeve as said expanding sleeve enters into said cavity falls into the area defined between said expanding sleeve and said cylindrical transition portion to thereby prevent any obstruction of said shank portion of said bolt from entering into said cavity, whereby said straight tips of said expanding sleeve are caused to engage the walls of said cavity by pulling on said outer end of said shank portion which thereby causes said cone to enter into said sleeve and expand outwardly said plurality of straight tips.

4,014,244
FLATTENED ROUND END STAPLE

Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.

Filed Oct. 22, 1975, Ser. No. 624,657
Int. Cl.² F16B 15/06
U.S. Cl. 85—49 1 Claim

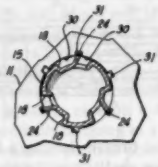
1. A staple formed without waste from a length of metallic rod stock material having a given cross-sectional area, for insertion into a telephone pole or like grained object, the staple comprising a straight bight portion having opposed flat top and bottom surfaces and opposed rounded side surfaces defining a bight cross-section of given area substantially equal to the rod stock material cross-sectional area, and a pair of tines extending substantially perpendicularly from the bight portion, each tine being defined by opposed outer and inner flat surfaces and opposed rounded side surfaces over a mediate portion defining a tine cross-section of given area substantially equal to the staple bight cross-sectional area, each tine including a tapering tongue at least partly defined by an outer and an inner flat surface extending from the mediate portion surfaces and diverging unnotched, straight side surfaces, the inner flat surface tapering toward the outer flat surface to intersect the outer flat surface in a line lying in the same plane as the extended outer flat surface of the tine mediate portion and tine tongue portion, and a tongue tip at the terminal tine end having an elongate, substantially rectangular cross-sectional area substantially equal to the staple bight and tine cross-sectional areas and an elongate cutting edge of substantially semi-circular configuration, each tine tongue tip lying in a plane parallel to the plane of the other tine tongue tip and perpendicular to the plane of the staple itself, for insertions between telephone pole grain striations, and a plurality of ratchet teeth formed only on the outer flat tine tongue surface, the teeth on each tine extending between said diverging side surfaces, thereby forming a series of teeth, each tooth having a greater length than the previous tooth from the tine mediate portion to the tine tongue tip, each tooth extending out of the plane of the outer flat tine tongue surface and being at least partly defined by a first substantially planar surface extending perpendicularly to the outer flat tine tongue surface and by another substantially planar surface extending obliquely to the first tooth surface, and said other surface of the lowermost tooth extending obliquely to the tine terminal elongate cutting edge, thereby forming a series of sturdy, agressive, ratchet-like teeth extending outwardly of the tine tongue.

4,014,245
FASTENER

John S. Frye, 3098 Trafalgar Way, Chamblee, Ga. 30341, and James B. Fuss, 3245 Enon Road, Atlanta, Ga. 30349

Filed May 28, 1975, Ser. No. 581,700
Int. Cl.² F16B 19/00
U.S. Cl. 85—5 P 4 Claims

1. A fastener for fastening together two sheets of metal having mutually aligned apertures defined by generally annular walls having a plurality of radially spaced notches therein, said fastener comprising a metallic tube having a plurality of tabs projecting said tube and being substantially axially aligned with said tube and positioned along chord extensions of said tube and of sufficient length to be seated in the aperture defining wall notches of the two sheets and bent off said chord extensions of said tube into locking engagement with the aperture defining wall notches to fasten the two sheets of metal to the fastener and thereby to each other, and wherein

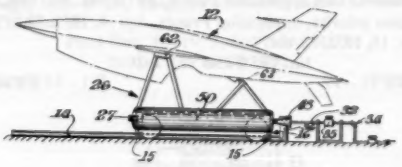


said metallic tube is formed with a first set of cylindrical segments of first radius unitarily joined together by a second set of cylindrical segments of second radius smaller than said first radius with said tabs positioned on said second set of cylindrical segments and being of sufficient length to project radially beyond said first set of cylindrical segments when bent.

4,014,246
ROCKET-POWERED APPARATUS FOR LAUNCHING A FLYING DEVICE

William J. Nissley, Jr., Wilmington, Del., assignor to All American Industries, Inc., Wilmington, Del.

Filed July 2, 1975, Ser. No. 592,394
Int. Cl.² F41F 7/02
U.S. Cl. 89—1.819 7 Claims

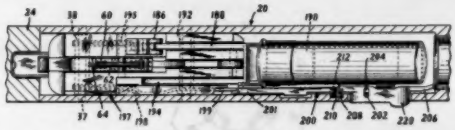


1. A rocket-powered launching apparatus for a flying device comprising a guide track having starting and terminal ends, a rocket-powered vehicle operatively engaged with the guide track, at least one rocket casing on the rocket-powered vehicle, an exhaust nozzle in the rear of the rocket casing, an arresting device disposed at the terminal end of the guide track for terminating the movement of the rocket-powered vehicle, a source of pressurized fluid at the starting end of the guide track, a latching device at the starting end of the guide track for preliminarily restraining movement of the rocket-powered vehicle, pressurized fluid loading probe means on the source of pressurized fluid for loading the pressurized fluid into the rocket casing through the nozzle while the rocket-powered vehicle is maintained latched to the starting end of the track, sealing means between the pressurized fluid probe means and nozzle whereby the generation of pressure in the casing is facilitated, and release means on the latching means for releasing the rocket-powered vehicle and allowing it to move down the guide track toward the terminal end for launching a flying device connected to it.

4,014,247
GAS-OPERATED SHOTGUN

James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company, Inc., Ithaca, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,072
Int. Cl.² F41C 13/00
U.S. Cl. 89—191 A 11 Claims



1. In a gas operated firearm having a barrel, a receiver, a magazine for supplying shells in succession to the receiver, a carrier within the receiver for moving shells received from the magazine to chambering position, bolt means for chambering shells and closing the breech end of the barrel, shell feed control means for coordinating the feeding of shells from the magazine, the movement of the carrier, and the chambering movement of the bolt, slide means for driving the bolt means, and gas operated means for operating the slide means, the improvement in the shell feed control means comprising:

a carrier latch lever, said firearm having a single shell stop which is formed integrally on said lever, said lever being pivotally mounted in said receiver for

a. latching the shell carrier in a lowered, shell-receiving position,

b. releasing a single shell from the magazine to be moved rearward under the action of the magazine spring onto the shell carrier,

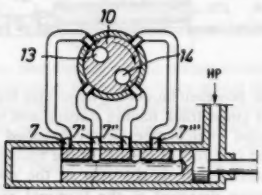
c. stopping the following shell in the magazine immediately after the previous shell has left the magazine, and

d. releasing the shell carrier for subsequent pivoting movement thereof into chambering position.

4,014,248
SERVOMECHANISM CONTROLLED STEP BY STEP

Luc Cyrot, Mission Viejo, Calif., assignor to D.B.A., Clichy, France

Continuation of Ser. No. 346,328, March 30, 1973, abandoned. This application June 6, 1975, Ser. No. 584,286
Claims priority, application France, Apr. 4, 1972, 72.11722; Nov. 15, 1972, 72.40477
Int. Cl.² F15B 15/17, 9/02
U.S. Cl. 91—19 5 Claims



1. Step by step controlled servomechanism adapted to resist an external force comprising

a. a cylinder (2);

b. a drive element (1) movable in said cylinder in first and second opposed directions, said drive element driving said cylinder into two chambers, (3,4) said drive element being provided with a plurality of spaced receiver ports (6) opening into one of said chambers (3);

c. a high pressure supply (HP) continuously applied to the other one of said chambers (4);

d. a high pressure source (13) and a low pressure source (14);

e. a distributor (9) for providing selective communication between said high pressure (13) and low pressure (14) sources and said receiver ports (6), said distributor (9) including a number of spaced transmitter ports (7) in the wall of said cylinder (2) at least equal to three but independent of the number of said receiver ports, the distance between adjacent receiver ports (6) being different than the distance between adjacent transmitter ports (7), said receiver ports (6) adapted to communicate with said transmitter ports (7), said distributor (9) further including means (10) for connecting said transmitter ports (7) by permutation, in succession and in pairs, respectively, to said low pressure source (14) and to said high pressure source (13),

f. at least some of said receiver ports being located adjacent a pair of said transmitter ports in such a position that said adjacently located receiver ports communicate neither with one nor with the other of said pair of transmitter ports, said pair of transmitter ports being coupled by said connecting means (10) to said high and low pressure sources, respectively, whereby a displacement in said first or second directions of said drive element due to the external force thereon puts one of said adjacently located receiver ports in communication with one or the other of said pair of transmitter ports to resist the external force thereby effecting a hydraulic locking of said drive element, and

g. another of said receiver ports being in communication with one of the transmitter ports of a next pair of transmitter ports to be coupled by said connecting means (10) with said high and low pressure sources, respectively, to thereby effect a step by step displacement of said drive element

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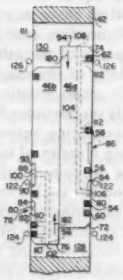
4,014,249
PNEUMATICALLY ACTUATED SANDING TOOL

James O. Taylor, Manalapan, Fla., assignor to Florida Pneumatic Manufacturing Corporation, Boynton Beach, Fla.

Filed Sept. 18, 1975, Ser. No. 614,677
Int. Cl.² F01L 21/02
U.S. Cl. 91—32 5 Claims



1. A fluid actuated portable sanding tool comprising:

a housing having a cylinder with a bore therein, means for supplying a pressurized fluid to a supply port in communication with said bore, and means for exhausting at least a first vent port and a second vent port in communication with said bore at corresponding first and second ends of said cylinder;

a double-ended piston slidably mounted for reciprocal movement within said cylinder, said piston having first circumferential main sealing means, a second circumferential main sealing means and a third circumferential main sealing means axially mounted along said piston at one end portion thereof for providing three slidable, fluid tight seals between said piston and the inner surface of said cylinder, thereby defining at said one end portion of said piston a first annular region and a second annular region respectively, said piston further having a first

annular slot between said first and said second main sealing means and a second annular slot between said second and said third main sealing means, the walls of said first slot proximate said first main sealing means and the wall of said second slot proximate said third sealing means each extending substantially vertically radially inwardly, and the walls of said first and second slot proximate said second sealing means beveled angularly radially inwardly away from each other, a first port in communication with said first annular slot, a second port in communication with said second annular slot, a third port in communication with said cylinder bore at said first end of said cylinder, a fourth port in communication with said bore at said second end of said cylinder, a first passage in said piston in communication with said first port and said third port, and a second passage in said piston in communication with said second port and said fourth port, and wherein said fluid supply means supplies pressurized fluid at a central portion of said bore for alternate communication with said first port and said second port;

a first circumferential end sealing means and a second circumferential end sealing means respectively mounted at the first and second ends of said piston for providing slidable fluid tight seals between said piston and the inner surface of said cylinder and wherein said first vent port and said second vent port have a size and are spaced apart a distance such that each port is alternately blocked by the respective end sealing means when said piston is being forced away from said port by the pressurized fluid; and wherein said piston has an annular radially inwardly beveled edge at each end, said first and said second end seals being mounted axially inward from and adjacent to the corresponding beveled edge;

starter means for displacing said piston towards one end of said cylinder such that one of said first and second ports is in communication with said fluid supplying means;

a mounting plate mounted for reciprocal motion on said housing;

and means for connecting said piston at a location between said third main sealing means and said second end sealing means to said mounting plate for reciprocally driving said mounting plate;

wherein said piston is reciprocally driven by said fluid which has been alternately delivered from said supply means to the respective ends of said bore by said first port, first passage and third port and by said second port, second passage and fourth port.

4,014,250

CYLINDER BLOCK POSITIONING ARRANGEMENT FOR A HYDRAULIC AXIAL PISTON MACHINE

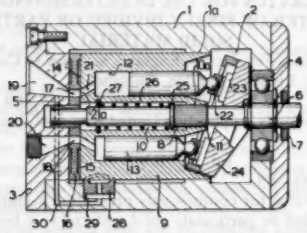
Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 31, 1972, Ser. No. 240,253

Claims priority, application Germany, Apr. 5, 1971, 2116619

Int. Cl.² F01B *1/22*

U.S. Cl. 91—487 **14 Claims**



1. In a hydraulic axial piston machine, a combination comprising a rotary cylinder block mounted for angular displacement about an axis of rotation and having a longitudinal axis which is intended to coincide with said axis of rotation, a block end face normal to said longitudinal axis, and a circumferential surface adjacent said end face, said cylinder block being provided with cylinders located along a circle concentric with said longitudinal axis and having a first radius, and cylinder ports communicating with said cylinders, respectively, and located on said block end face along a circle concentric with said longitudinal axis and having a second radius smaller than said first radius; a stationary body having a control face normal to said axis of rotation and being in sliding contact with said block end face, said stationary body being provided with high pressure conduit means and low pressure conduit means respectively opening in a high pressure control port and in a low pressure control port on said control face, said control ports being located along a circle concentric with said axis of rotation and having said second radius so as to communicate with said cylinder ports, whereby a tilting moment acts on said cylinder block in a sense tending to incline said longitudinal axis with respect to said axis of rotation and said block end face with respect to said control face; and positioning means for counteracting said tilting moment and the inclination of said longitudinal axis with respect to said axis of rotation including a positioning cylinder member and a positioning piston member in said positioning cylinder member, one of said positioning members engaging a portion of said circumferential surface of said cylinder block axially adjacent said block end face, and being movable in a direction normal to said axis of rotation toward and away from the same whereby to restore the coincidence of said longitudinal axis with said axis of rotation.

4,014,251

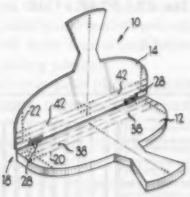
CRAFT DEVICE FOR MAKING AERIAL PROJECTILES FROM SHEET MATERIAL

Burton C. Meyer, Downers Grove, and Leigh Copeland, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 630,720

Int. Cl.² B31D *5/02*

U.S. Cl. 93—1 R **9 Claims**



1. A method for making aerial projectiles from sheet material such as paper, or the like, comprising the steps of:

providing a press having complementary means on the respective portions thereof for deforming the sheet material in a predetermined manner to define a set of fold lines;

placing the sheet material in the press;

pressurizing the press to deform the sheet material;

folding the sheet material along said predetermined fold lines to define the shape of a projectile having desired aerodynamic characteristics to sustain the projectile in flight; and

trimming the sheet material about the outline of the press.

4,014,252

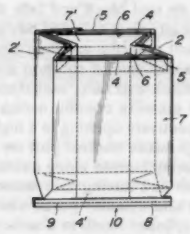
METHOD OF MANUFACTURING BAGS

Akio Saito, Tokorozawa, Japan, assignor to Show Seitai Kogyo Kaisha Ltd., Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,731

Int. Cl.² B31B 49/04

U.S. Cl. 93—35 R 5 Claims



1. In a method of manufacturing a bag which comprises the steps of:

continuously playing out a continuous web of a blank;

bonding together the side edges of the blank to form a tubular body;

cutting the tubular body along spaced cutting lines into a plurality of sections each having a length substantially equal to the length of the completed bag;

the improvement comprising:

bonding reinforcing members to said blank, the intermediate portions of said reinforcing members being aligned with said cutting lines;

cutting said blank together with said reinforcing members along said cutting lines to form said sections;

flattening the bottom end of each section;

bending up a portion of said bottom end at right angles;

separating the opposite sides of the bent up end portion;

folding back the separated sides toward each other, said reinforcing member facing outwardly; and bonding another reinforcing member to said first mentioned reinforcing member.

4,014,253

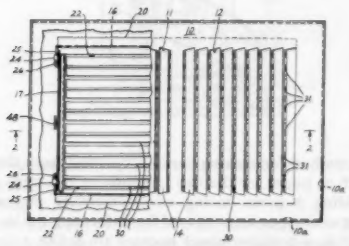
ADJUSTABLE DIFFUSERS

Hal Dry, Winters, Tex., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,887

Int. Cl.² F24F 13/08

U.S. Cl. 98—121 A 8 Claims



1. Diffuser, comprising a plurality of side by side parallel vanes, each said vane having in line with the plane of the vane a longitudinal central pivot extending from an intermediate point of each of its ends, means for pivotally supporting each said vane at each of its said central pivots whereby said vane is rotatable about an axis defined by its said central pivots, said vanes each having at the same ends thereof and in line with the plane of the vane a longitudinal offset pivot shorter than the central pivot at that end of the vane, slotted plate means supported for reciprocal movements along the line of said same ends of said vanes, said slotted plate means having at the end of each vane a J-slot having a straight slot portion parallel to said line of said same ends of said vanes and having a hook-shaped slot portion at one end thereof, said central and offset pivots of said vanes being disposed slidably movably in said J-slots, means beyond the ends of said offset pivots for restraining each said central pivot against lateral movements, and means for reciprocatingly moving said slotted plate means to move said central and offset pivots of said vanes along said slots thereof and to move said offset pivots between said straight portions of the slots and the curved portions thereof to rotate said vanes between open and closed positions.

4,014,254

DEVICE FOR WRAPPING SHEETS AROUND FOOD IN ROLLED FORM AND OTHER FOOD PROCESSING DEVICES

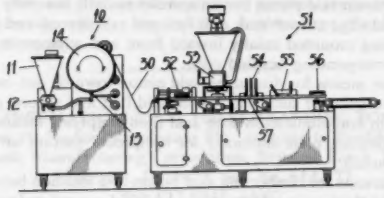
Nobuyoshi Ohkawa, Amagasaki City, Japan, assignor to Daieigiken, Inc., Amagasaki, Japan

Filed Mar. 12, 1974, Ser. No. 450,489

Claims priority, application Japan, Mar. 12, 1973, 48-29192; Mar. 12, 1973, 48-29193; Mar. 12, 1973, 48-29194

Int. Cl.² A21C 9/06

U.S. Cl. 99—450.6 6 Claims



1. A device for wrapping previously made pre-cut dough sheets around a mixture of minced vegetables, meat and the like, to make rolled food, comprising, in combination: a first device for supplying the mixture to the dough sheets; a second device for doubling the filled dough sheets; and a third device for folding over the filled and doubled dough sheets; wherein said second device includes a stationary cradle having substantially parallel teeth with at least one cut-out in said cradle; at least two bending arms in respective planes that are substantially perpendicular to that of said cradle, movable at least partly through said cut-out about an arc-shaped path; at least one lateral pressing bar extending over and at least partly across said cradle, for holding down the sheets to the upper surface of said cradle, after they have been folded; and a shaping member pivotable toward and away from said cradle, for securing the mixture to the doubled dough sheets while on said cradle.

4,014,255

APPARATUS FOR USE IN DETERMINING THE CHARACTER OF FINELY DIVIDED OR PARTICULATE SOLID MATERIAL

Edward James Fox, Derby, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Nov. 19, 1974, Ser. No. 525,200

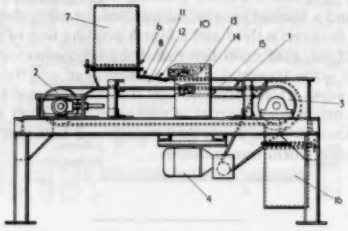
Claims priority, application United Kingdom, Dec. 14, 1973, 58022/73

Int. Cl.² B30B 15/00

U.S. Cl. 100—99 7 Claims

1. Apparatus for continuously presenting a uniform bed of finely divided or particulate solid material to a beam of electro-magnetic radiation to determine a characteristic of the material, comprising:

a linear conveyor having a flat material conveying surface,
means for driving said conveyor at a substantially continuous and uniform speed,
a feed hopper positioned adjacent the upstream end of said conveyor for delivering the material onto the moving conveying surface,
a stationary inverted trough shaped guide assembly extending from beneath the downstream side of said feed hopper with its longitudinal axis substantially parallel to the conveyor and having a first zone with substantially parallel walls for defining the upper and side boundaries of the bed of material being conveyed and a second zone with



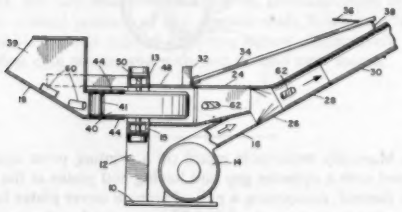
all walls inclined toward the conveying direction to provide compaction of the material passing therethrough so that the bed of material is of a substantially constant bulk density,
a sampling section having a source and detector of electromagnetic radiation positioned adjacent said guide assembly in which the bed of material is presented to a beam of electro-magnetic radiation for determining a characteristic of said material, and
a collection means positioned adjacent the downstream end of said conveyor into which the sampled material is discharged and collected.

4,014,256

CAN CRUSHER DELIVERY MECHANISM

Charles McRea Davis, Jr., 5209 Nannette St., Bonita, Calif. 92002

Filed Mar. 26, 1976, Ser. No. 671,018
Int. Cl.² B30B *3/04*
U.S. Cl. 100—159 **5 Claims**



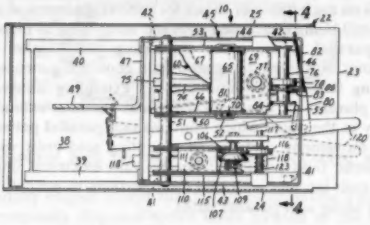
1. A can crusher comprising:
a pair of wheels with at least one wheel having a resilient tire,
frame means for holding said wheels rotatably in horizontal orientation and in abutting alignment for rotational contact,
means for rotating at least one of said wheels,
hopper means for receiving cans and positioning the cans to be moved into the intersecting contact of said wheels to be crushed in passage between said wheels,
a tube being aligned with the intersecting contact of said wheels, on the discharge side thereof, for receiving crushed cans,
a second tube being angled upwardly, and joining the open end of the first tube, whereby said cans, being discharged at a high velocity from said intersecting wheels move upwardly in said second tube,
blower means for providing air under pressure,
the lower end of said second tube, being connected to said blower whereby air passes upwardly through said second tube for contacting cans moving at a velocity up said tube, for moving the cans through said second tube to a point of discharge.

4,014,257

APPARATUS FOR DIE CUTTING INDICIA ON A MULTILAYER TAPE

Larry A. Bettenhausen, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 28, 1975, Ser. No. 599,357
Int. Cl.² B44B *5/00*
U.S. Cl. 101—26 **9 Claims**

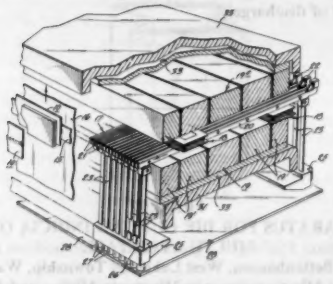


1. A machine for cutting one layer of a multilayer tape to form indicia from said one layer for forming messages, said indicia corresponding to indicia formed on one or more die plates having a raised cutting ridge formed thereon to define the outline of the indicia, said machine comprising:
a main frame having a longitudinal axis,
tape guide means for guiding a said tape along a path transversely across said main frame and oblique to said longitudinal axis, said guide means including a plate supported rigidly on said main frame and having a flat surface area defining a cutting platen,
means for receiving a die plate adjacent said cutting platen with the cutting ridge extending away from the cutting platen,
feed means for incrementally advancing said tape along said guide means and past said cutting platen,
a first movable frame supported for movement along said main frame parallel to said longitudinal axis,
a second movable frame pivotally mounted on said first movable frame and movable therewith,
a roller rotatably mounted on said second movable frame and supported, with its axis transverse to said longitudinal axis, by spring means to urge said roller toward said cutting platen,
cam means on said main frame and said second frame for urging said second frame toward said cutting platen and said roller into pressure contact toward said cutting platen when said first movable frame is moved in a first direction along said longitudinal axis and across said path of a said tape and to retract said second frame and said roller relative to said cutting platen when said first frame is moved in the opposite direction.

4,014,258
HIGH SPEED PRINTING APPARATUS

Carl I. Wassermann, 45 Hill Park Ave., Great Neck, N.Y. 11021

Filed Aug. 29, 1975, Ser. No. 608,902
Int. Cl.² B41J 9/38
U.S. Cl. 101—93.29 16 Claims

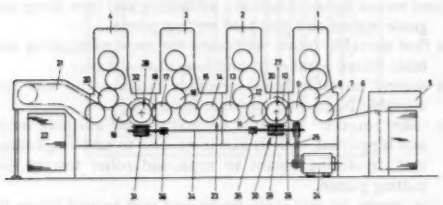


1. In a printer or the like, a plurality of hammers each having an elongated shank with an impact tip adjacent one end, means mounting said hammers for movement in side-by-side parallel paths along the longitudinal axes of said shanks whereby impressions are made on a surface adjacent the tips, a coil on each hammer shank for receiving electrical impulses, said coil being positioned with the turns lying in planes which are parallel to the plane containing said parallel paths of hammer movement, magnetic field generating means for generating fields in continuous zones extending transversely of said plurality of hammers with field portions extending normally to the plane which contains said parallel paths of hammer movement, and means mounting said coils within said magnetic field portions whereby said electrical impulses in said coils interact with said field portions to propel said hammers along said parallel paths.

4,014,259
DRIVE FOR MULTICOLOR SHEET-FED ROTARY PRINTING PRESSES WITH TANDEM-MOUNTED PRINTING UNITS

Willi Jeschke, Heidelberg-Boxberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Aug. 9, 1974, Ser. No. 496,168
Claims priority, application Germany, Aug. 9, 1973, 2340343
Int. Cl.² B41F 5/02
U.S. Cl. 101—183 2 Claims

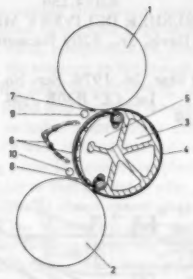


1. In a drive for a multicolor sheet-fed rotary printing machine with tandem-mounted printing units driven by a closed gear train and including a drive motor, a drive train driven by the motor and extending parallel to the closed gear train, at least two force input locations connecting the closed gear train to said drive train, said drive train comprising n-1 torque limiters for limiting the amount of torque applied respectively at said input locations, wherein n is equal to the number of force input locations being provided in said drive train, one of said force input locations being disposed in a path of direct power flow between the motor and the gear train, a respective torque limiter being located between the respective force input locations and having soft transmission means for yieldably transmitting a moment up to a given maximum to said closed gear train at the other of said force input locations, the printing machine being of the four-color type and said drive train being constructed as a main drive shaft and including a first and a second worm transmission, said gear train including a first gear on an intermediate transfer cylinder located between a first and a second printing unit of the printing machine, and a second gear on an intermediate transfer cylinder located between a third and a fourth printing unit of the printing machine, said main drive shaft being connected through said first worm transmission to said first gear, and through said second worm transmission to said second gear, said soft transmission means forming part of said main drive shaft and being constructed at least partly as a torsion rod between said first and second worm transmissions.

4,014,260
REMOVABLE GUARD ON CYLINDERS OF PRINTING PRESSES

Wilhelm Schröter-Dommes, Ludwigshafen, and Wilfried Vogt, Walldorf, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Nov. 13, 1975, Ser. No. 631,682
Claims priority, application Germany, May 10, 1975, 2520920
Int. Cl.² B41F 13/08
U.S. Cl. 101—212 6 Claims



1. Manually removable guard on a printing press cylinder formed with a cylinder gap and having end plates at the axial ends thereof, comprising a pair of arcuate cover plates having respective concave and convex faces, means forming an articulating connection of said cover plates along respective mutually adjacent longitudinal sides thereof so that said cover plates are foldable concave face-to-concave face along said adjacent longitudinal sides thereof, and a leaf spring extending from one to the other of said cover plates transversely to said longitudinal sides thereof and adjacent the respective concave faces thereof, said leaf spring prestressing said plates into a substantially circular arcuate configuration corresponding to that of the cylindrical surface of the printing press cylinder, said cover plates being manually yieldingly foldable concave face-to-concave face along said adjacent longitudinal sides thereof and together with said leaf spring against the prestressing biasing force of the latter and engageable with the end plates of the printing press cylinder so as to cover and bridge the cylinder gap.

4,014,261
CONVERSION DEVICE OF A STORAGE DRUM FOR SHEET TRANSFER

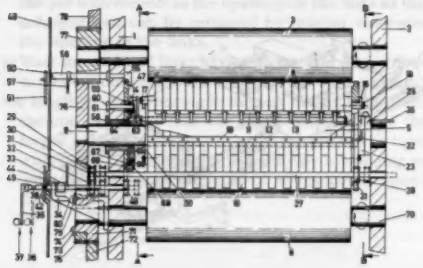
Willi Becker, Bammental, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Dec. 22, 1975, Ser. No. 642,695

Claims priority, application Germany, Dec. 20, 1974, 2460503

Int. Cl.² B41F *5/02, 21/04*

U.S. Cl. 101—230 **17 Claims**



1. In an assembly of a sheet-transfer drum, a sheet-turning drum and a storage drum mounted on a shaft and located therebetween for transporting a sheet between individual printing units of a rotary printing press, a change-over mechanism for converting the printing press from single-side sheet printing to double-side perfector printing and conversely as well as to different format sizes, the change-over mechanism comprising a control shaft axially displaceable from a non-controlling position to a single control position, a first control pinion mounted on said control shaft, first adjusting means for adjusting format size for double-side perfector printing, said first control pinion being forcibly coupled to said first adjusting means, a second control pinion mounted on said control shaft, second adjusting means mounted for rotation about the shaft of the storage drum, drive gear means for converting the rotary printing press from single-side sheet printing to double-side perfector printing, first cam means for adjusting the printing press from single-side sheet printing to double-side perfector printing and conversely, second cam means for adjusting the format size for double-side perfector printing, said first control pinion in said single control position of said control shaft, being in meshing engagement with said drive gear means, and said second control pinion, simultaneously in said single control position of said control shaft, being selectively couplable by said second adjusting means alternatively with said first cam means and with said second cam means.

4,014,262
BLAST SIMULATOR

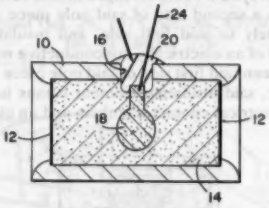
Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,980

Int. Cl.² F42B *4/18*

U.S. Cl. 102—28 R **1 Claim**

1. A blast simulator for a noise environment tester in a simulated missile launcher, said blast simulator comprising: a cylindrical tube provided with openings at the ends thereof, said tube provided with an opening between said ends; a pyrotechnic charge disposed within said tube and between said ends; a disc disposed in each end to enclose said charge, an electric squib disposed in said opening between the cylinder ends; means for protecting said pyrotechnic charge against moisture, said protecting means including a sealant placed over said opening to seal said pyrotechnic charge and wires



connected to said squib to ignite said squib and said pyrotechnic charge.

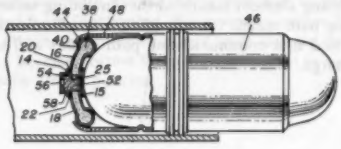
4,014,263
CASELESS PROJECTILE

Roy D. Plumer, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,074

Int. Cl.² F42B *5/00*

U.S. Cl. 102—38 **4 Claims**



1. A caseless high pressure chambered projectile which comprises:

a toroidally shaped hollow tubular chamber having a pair of diametrically disposed spoke holes located in the inner wall of said tubular chamber and a plurality of gas vent orifices positioned in the rear side of said tubular chamber;

a propellant material disposed in said tubular chamber;

means for covering the gas vent orifices of said tubular chamber after said propellant has been loaded in said tubular chamber, said means keeping said propellant sealed in said tubular chamber and free from ambient contamination when said projectile is in an unfired state;

spider means operatively positioned in said pair of spoke holes of said tubular chamber for igniting said propellant material located in said tubular chamber; and

retaining sheath means for fixedly holding said integrally connected spider means and tubular chamber to said projectile so that said gas vent holes in said high pressure chamber are positioned to vent rearwardly of said projectile into a low pressure cavity of a launcher when said projectile is fired from said launcher.

4,014,264
COMBINED IGNITER CAP

Hellmut Bendler, Nurnberg, and Heinz Gawlick, Furth, Bayern, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Aug. 21, 1975, Ser. No. 606,448

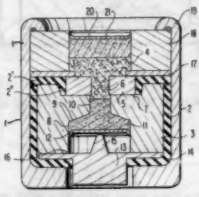
Claims priority, application Germany, Sept. 13, 1974, 2443793

Int. Cl.² F42C *19/10, 19/12*

U.S. Cl. 102—46 **25 Claims**

1. A combined igniter cap comprising an electrically conductive housing having a unitary one-piece pole piece arranged therein, a first primer charge arranged on a first side of

said pole piece, said pole piece being provided with a recess and means providing a first communicating path through said pole piece between said recess and said first primer charge, a second ignition system being arranged in said recess and being ignitable from a second side of said pole piece which is disposed oppositely to said first side, and insulating element means formed of an electrically nonconductive material being disposed between said first side of said pole piece and said first primer charge, said insulating element means including first and second electrical contact members and an electrical igni-



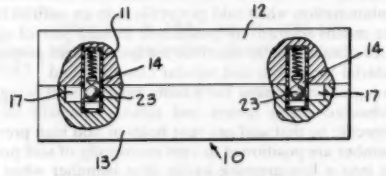
tion means formed therebetween, said electrical ignition means being arranged immediately adjacent a surface of said nonconductive material facing said first primer charge, said first contact member being electrically conductively connected with said pole piece and said second contact member being electrically conductively connected with said housing, said insulating element means further including second communicating path means for providing a communicating path between said first communicating path means and said first primer charge.

4,014,265

VEHICLE INCAPACITATOR

Irving L. Kintish, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1964, Ser. No. 410,050
Int. Cl.² F42C *15/22*
U.S. Cl. 102—70 S **2 Claims**



1. A vehicle incapacitator comprising

a rotatable body of cast explosive having at least one cavity therein,

a container seated in said cavity and having a flexible sidewall construction, said sidewall having an opening,

a detonator within said container contacting said explosive,

a firing pin having a conical forward surface for initiating said detonator, and

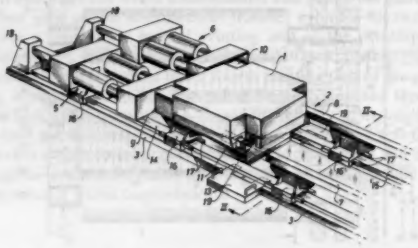
means larger than said opening and normally engaging said forward surface for preventing said firing pin from initiating said detonator until a predetermined centrifugal force is imparted to said preventing means to thereby laterally displace said preventing means through said opening and release said firing pin to impinge on and initiate said detonator.

4,014,266

TRANSPORT TRACK AND SLIDING CARRIAGE FOR MOVING HEAVY LOADS

Sören Näslund, Lidkoping, and Gösta Martin Bohm, Vasteras, both of Sweden, assignors to Paul Anderson Industrier AB, Vasteras, Sweden

Filed Sept. 25, 1975, Ser. No. 616,531
Claims priority, application Sweden, Oct. 4, 1974, 7412554
Int. Cl.² B61B *13/08*
U.S. Cl. 104—162 **7 Claims**



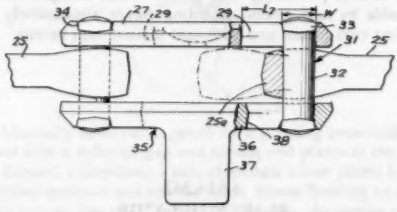
1. A transport system comprising: a track, a sliding carriage movable along the track for transporting heavy loads in a substantially horizontal direction, said track having a bottom plate positioned loosely on a support capable of bearing heavy loads, said bottom plate having an upper surface designed so as to provide minimum resistance to the movement of the sliding carriage over the upper surface; at least one rod attached to the bottom plate and extending in the longitudinal direction of the transport track; said rod guiding said carriage and removable while a load is present on said bottom plate; a climbing jack intended for moving said sliding carriage; and, means for transferring axial forces arising in said rod to said bottom plate.

4,014,267

CONVEYOR CHAIN STRUCTURE

Harold G. Fitch, Clarkston, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 378,506, July 12, 1973, abandoned.
This application June 30, 1975, Ser. No. 591,873
Int. Cl.² B61B *13/00*
U.S. Cl. 104—172 C **8 Claims**



1. In a power and free conveyor system, the combination comprising

load supporting means along which carriers are moved in a predetermined path,

supporting means mounted along said load supporting means defining a conveyor chain supporting structure,

and a conveyor chain supported by said supporting means comprising a plurality of substantially identical alternate main links,

alternate pairs of substantially identical upper and lower links between said main links,

each of said main and upper and lower links having longitudinally extending openings adjacent their ends having a

greater length than width such that each opening has an axis extending longitudinally of its respective link,

and a pivot pin interconnecting the main links and upper and lower links and comprising a central portion extending through the opening in the main links and an enlarged transverse portion extending transversely of the upper and lower links,

said transverse portion having a longer dimension and a shorter dimension,

said chain being disengageable without tools by rotation of the pin with respect to the openings in the links so that the enlarged end can be removed by relative movement of the opening in the links,

at least some of said links having an integral pusher member extending outwardly intermediate the ends thereof,

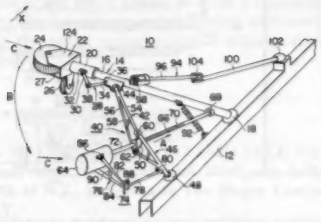
the length of each opening in the link having the pusher dog thereon being less than the longer dimension of the enlarged portion of the pin such that the pin can be removed with respect to the pusher dog only by a swinging movement with respect to the axis of its respective opening.

4,014,268

STEERING CONTROL MECHANISM

Yukiyoshi Hatori, Tokyo, and Hiroshi Sugiyama, Hiratsuka, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 14, 1975, Ser. No. 604,781
Claims priority, application Japan, Aug. 16, 1974, 49-93967
Int. Cl.² B61B *12/02*
U.S. Cl. 104—247 **21 Claims**



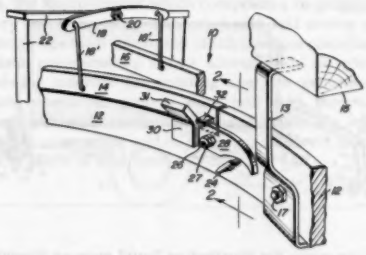
1. A steering control mechanism for a vehicle comprising, a support structure, a guide arm, means for connecting said guide arm to said support structure for universally swinging movement, a guide element supported on said guide arm for engagement with a guide wall of a guideway for a vehicle, said guide arm being swingable between an operative position in which said guide element is positioned in use for engagement with said guide wall to guide the direction of travel of said vehicle along said guide wall and an inoperative position in which said guide element is out of engagement with said guide wall, a first control arm foldable at its mid portion, means for connecting said first control arm to said support structure for universally swinging movement, means for connecting said first control arm to said guide arm for pivotal movement, operating means for folding and unfolding said first control arm for swinging said guide arm toward and away from said support structure, a second control arm, means for connecting said second control arm to said support structure for universally swinging movement, said guide arm being located between said first and second control arms, and means for connecting said second control arm to said guide arm and for lifting said guide arm from said operative position into said inoperative position when said guide arm is swung toward said supporting structure by said first control arm and for lowering said guide arm from said inoperative position into said operative position when said guide arm is swung away from said support structure by said first control arm.

4,014,269

SAFETY STOP FOR OVERHEAD TRACK SWITCH

Beryl A. Bedford, 701 Hurlingame Ave., Redwood City, Calif. 94063

Filed Oct. 29, 1975, Ser. No. 627,014
Int. Cl.² B61K *7/20*
U.S. Cl. 104—250 **3 Claims**



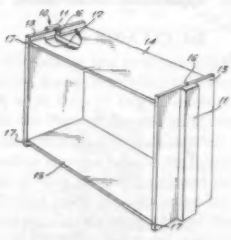
1. A safety stop for an overhead track switch comprising; a mounting means for attachment of the stop to a conventional overhead track, a safety stop member pivotally mounted on said mounting means, a weight for moving the stop to the safety position, the safety stop member having a cam portion for engagement with a track being switched to prevent the safety stop from functioning, the mounting means includes a bolt for attachment to an overhead track and the head of the bolt has a beveled portion for guiding a track to be switched to its normally closed position.

4,014,270

KNOCK-DOWN CONSTRUCTION

Paul Anstee Frank King, 7 Victoria St., Paddington, New South Wales 2021, Australia

Filed Feb. 9, 1976, Ser. No. 656,843
Int. Cl.² A47B *3/00*
U.S. Cl. 108—111 **7 Claims**



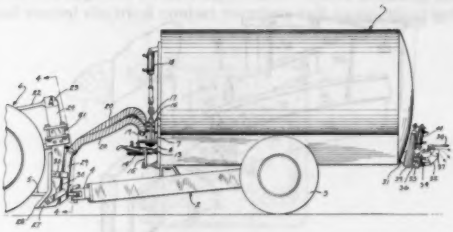
1. A knock-down furniture component comprising first and second parallel panels positioned in facing relationship so as to have inwardly facing surfaces and outwardly facing rectangular frame means engageable with the outwardly facing surfaces of said first and second parallel panels for preventing outward movement of said panels away from each other and structural means positioned between and engaging other inwardly facing surfaces of said panels for preventing inward movement of said panels toward each other.

4,014,271

LIQUID MANURE SYSTEM

Vincent E. Rohlf, Sturgeon Bay; Karl R. Kratz, and Richard F. Hucek, both of Algoma, all of Wis., assignors to The Calumet Co., Inc., Algoma, Wis.

Filed Nov. 5, 1975, Ser. No. 628,988
Int. Cl.² A01C *23/02*
U.S. Cl. 111—7 **7 Claims**



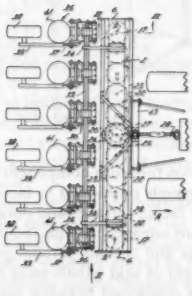
1. An apparatus for distributing liquid manure beneath the ground surface, comprising a mobile chassis, a tank to contain the liquid manure and mounting on the chassis, said tank having an outlet opening in an end wall thereof, a frame to be connected to a vertically movable hitch of a vehicle and adapted to be raised and lowered in accordance with operation of said hitch, a plurality of soil penetrating members mounted on the frame and adapted to penetrate the soil when the frame is lowered, conduit means for conducting liquid manure from the tank and including a delivery tube mounted immediately behind each soil penetrating member whereby the liquid manure will be discharged below the surface of the soil, an auger assembly including a housing located on the inside of the tank and connected with a outlet therein, said auger assembly also including an auger disposed within the housing and disposed to convey liquid manure through said housing to said outlet, said auger assembly having a length substantially less than the length of the tank, the outer end of the auger extending through said end wall and the inner end of the auger terminating within the interior of the tank, the axis of the outlet being offset from the axis of the auger, and drive means mounted on said end wall of the tank and located on the outside of the tank and operably connected to the outer end of the auger for driving the same.

4,014,272

CULTIVATORS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 2, 1975, Ser. No. 574,248
Claims priority, application Netherlands, May 3, 1974, 7405945
Int. Cl.² A01B *33/00*
U.S. Cl. 111—65 **10 Claims**



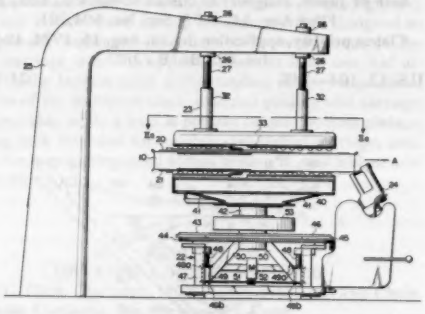
1. A cultivator comprising a frame movable over the ground and a plurality of rotatable soil-working members supported on a portion of said frame and said members being positioned in a row that extends transverse to the direction of travel, said soil-working members each including a downwardly extending tine and driving means connected to rotate said members and the corresponding tines about substantially vertical axes, said tine of each soil-working member being driven through a circular path about its axis of rotation to work a strip of land during travel, the spacing between the axes of rotation of adjacent soil-working members exceeding the working widths of the tines of adjacent members and said members being positioned to work strips of land spaced apart from one another between unworked strips, devices for depositing material on the worked strips being supported on said cultivator and each of said devices being positioned to the rear and in line with each said member, with respect to the direction of travel.

4,014,273

MATTRESS COVERING SEWING MACHINE

Tamajiro Kosakai, Musashimurayama, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,929
Claims priority, application Japan, Dec. 27, 1974, 50-522
Int. Cl.² D05B *11/00*
U.S. Cl. 112—3 R **14 Claims**



1. A mattress covering sewing machine comprising:

a pair of upper and lower support means each having a flat variable width support assembly and adapted to sandwich therebetween a cushion covered on all sides with outer covers, the widths of the variable width support assemblies being adjustable so as to correspond to the width of a mattress to be formed;

compressing means for substantially uniformly compressing the covered cushion, in the direction of the thickness of the covered cushion, through at least one support assembly;

sewing means for sewing together the outer marginal edge portions of the adjacent outer covers in such a compressed state to form a mattress; and

feeding means for supportingly feeding said sewing means around the entire outer marginal edge portions of the outer covers.

4,014,274

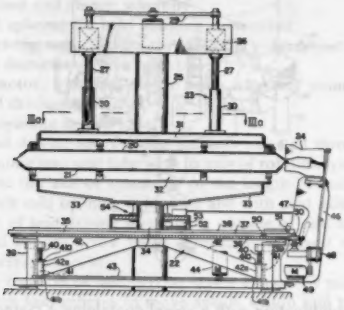
METHOD AND MACHINE FOR SEWING TOGETHER MATTRESS COVERS

Tamajiro Kosakai, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,825
Claims priority, application Japan, Dec. 27, 1974, 50-519
Int. Cl.² D05B *11/00*
U.S. Cl. 112—3 R **15 Claims**

1. A mattress covering sewing machine comprising:

a pair of upper and lower support means supportingly sandwiching therebetween a cushion wrapped with a pair of outer covers, said paired support means each having a variable width support plate, the outer peripheral portions of the support plates extending toward each other and being shaped to correspond to the outer peripheral portion of the wrapped cushion and coming into contact with the outer peripheral portion of the wrapped cushion, the widths of the variable width support plates being adjustable so as to correspond to the width of a mattress to be formed;



compression means for compressing the wrapped cushion, through at least one support plate, in the direction of the thickness of the cushion to cause the outer marginal edge portions of the outer covers to be projected outward;

sewing means for sewing together the outer marginal edge portions of the outer covers to form a mattress; and

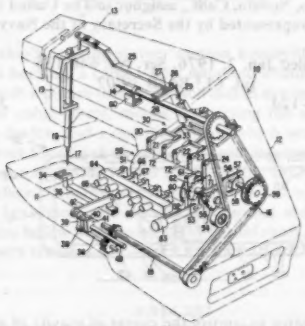
carrier means for supportingly carrying said sewing means around the entire outer marginal edge portions of the outer covers.

4,014,275

SEWING MACHINE RE-PROGRAMMABLE MEMORY

John Addison Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,776
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 E 11 Claims



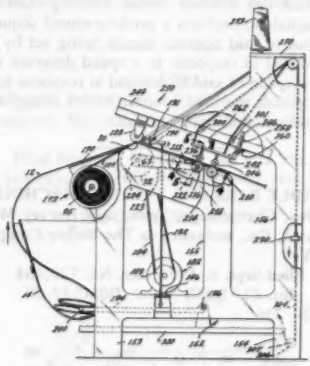
1. In a sewing machine operative to form successive stitches having stitch forming instrumentalities including an endwise reciprocating and laterally jogging needle means, and work feeding means for transporting work relative to said needle means, the relative positions of said needle means and said work feeding means defining stitch position coordinates for each endwise reciprocation of said needle means, at least one control device for influencing the stitch position coordinates of said successive stitches in the formation of a pattern of stitches, an electronic read-only-memory unit in said sewing machine for storing stitch pattern data, logic means electrically connected with said read-only-memory unit for extracting stitch position coordinate pattern data from said read-only-memory unit and actuating means for said control device responsive to said stitch pattern data extracted by said logic means, the improvement which comprises a re-programmable memory unit operatively associated with said sewing machine for storing operator generated stitch position coordinate pattern data, programming means accessible to an operator at said sewing machine for entering operator generated stitch position coordinate pattern data into said programmable memory unit, and operator influenced means for selectively electrically connecting said re-programmable unit to said logic means in place of said read-only-memory unit.

4,014,276

MACHINE FOR PROCESSING DRAPERY MATERIAL

Enrique Soto, 1638 W. Washington Blvd., Los Angeles, Calif. 90007

Continuation-in-part of Ser. No. 390,332, Aug. 22, 1973, Pat. No. 3,884,747. This application Jan. 6, 1975, Ser. No. 538,788
Int. Cl.[2] D05B 27/10
U.S. Cl. 112—214 5 Claims

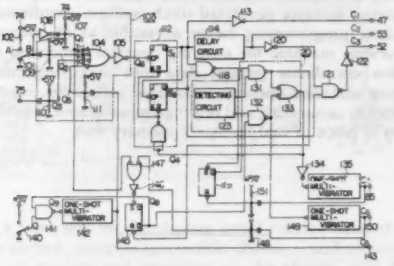


1. A machine for tabling and processing fabric material, the said machine having means providing a surface constructed to have a relatively wide strip of fabric material pass through it from the front to the back of the machine, means for causing the material to pass through the machine over the said surface, means for processing an edge part of the fabric material at one side of the machine, said processing means including a source of a strip of stiffening material positioned for juxtaposing the stiffening material against an edge part of the fabric material and moving it with the fabric material, said processing means including a power driven sewing machine positioned to stitch an edge part of the fabric material to the strip of stiffening material, tangent roller means having axis positioned normally to the direction of movement of the fabric material and to have the edge part of the fabric material and attached stiffener material pass between them, and manually actuable means for moving one of said tangent rollers away from the other whereby to allow threading of the fabric material and stiffener strip between them.

4,014,277
CONTROL APPARATUS FOR SEWING MACHINE WITH AUTOMATIC NEEDLE STOPPING MEANS

Shigeki Morinaga, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 12, 1975, Ser. No. 576,600
Claims priority, application Japan, May 15, 1974, 49-53326
Int. Cl.[2] D05B 69/18
U.S. Cl. 112—219 A 6 Claims

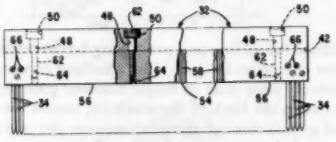


1. A control apparatus for sewing machine with automatic needle stopping means, comprising a motor for supplying a driving force to a sewing machine, a speed control device for controlling the rotational speed of said motor by controlling a driving thyristor connected to said motor, a position detector unit for detecting the position of a needle of said sewing machine, a braking unit for applying a braking force to said motor to stop said motor and said sewing machine, and a pedal manipulated by an operator for manipulating said sewing machine, said speed control device including a command unit having at least one counter means which produces central command signals to perform a predetermined sequence control, the input of said counter means being set by electrical signals generated in response to a speed detector means for detecting the speed of said motor and in response to the position of said pedal, and said counter means being reset by an output of said position detector unit.

4,014,278
NEEDLE BARS FOR TUFTING MACHINES

Paul E. Jolley, Chattanooga, Tenn., and Harvey M. Wooten, Rising Fawn, Ga., assignors to The Singer Company, New York, N.Y.

Filed Sept. 8, 1976, Ser. No. 720,484
Int. Cl.[2] D05B 55/02; D05C 15/00
U.S. Cl. 112—226 3 Claims

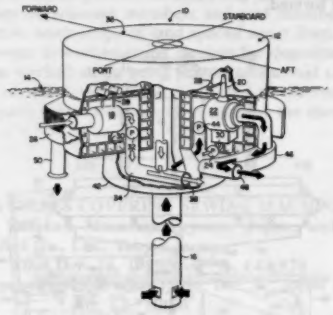


1. A needle bar for a tufting machine or the like for supporting a multiplicity of needles for reciprocable movement toward and away from a backing, each of which needles includes a shank portion, said needle bar comprising a longitudinally extending body portion having an open faced channel extending longitudinally therein and facing said backing, an insert secured in said channel spaced from at least one longitudinally extending wall thereof, said insert having a multiplicity of needle shank accommodating grooves extending in the direction of reciprocation of said needle and facing said longitudinally extending wall, and means for securing each shank intermediate a respective groove and said wall.

4,014,279
DYNAMIC POSITIONING SYSTEM FOR A VESSEL CONTAINING AN OCEAN THERMAL ENERGY CONVERSION SYSTEM

Russell O. Pearson, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 28, 1976, Ser. No. 681,003
Int. Cl.[2] B63B 35/00
U.S. Cl. 114—270 12 Claims



1. In combination with a vessel containing a system for an ocean thermal energy conversion process in which heat is extracted from warm ocean surface waters to vaporize a working fluid liquid and heat is rejected to cold waters collected from the lower depths of the ocean to condense the working fluid vapor, the improvement in a dynamic positioning means utilizing the sea water effluents resulting from said energy conversion process for positioning the vessel, said dynamic positioning means comprising:

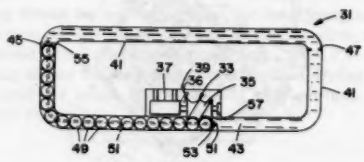
a. means aboard said vessel for collecting said sea water effluents resulting from said energy conversion process; and

b. means aboard said vessel for controllably directing the discharge of said collected effluents in a plurality of different horizontal directions to attain a resultant net propulsive force acting in a preferred direction upon said vessel.

4,014,280
ATTITUDE CONTROL SYSTEM FOR SEAGOING VEHICLES

Darryl E. Laxo, Novato, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1976, Ser. No. 646,135
Int. Cl.[2] B63B 39/02
U.S. Cl. 114—124 3 Claims



1. An apparatus to control the center of gravity of an object comprising:

a. a cylindrical tube;

b. a plurality of solid spheres located inside of said tube;

c. said spheres having a diameter slightly less than the inside diameter of said tube in order to allow said spheres to slidably move within said tube along the axis of symmetry of said tube;

d. said spheres being comprised of a first end sphere, a second end sphere, and remaining spheres lying in-between said first end sphere and said second end sphere;
e. a cable;
f. a length of said cable passing through the center of each of said spheres;
g. a first end clamp and a second end clamp;
h. the fixed attachment of said first end clamp to said cable and the fixed attachment of said second end clamp to said cable with each of said spheres abutting another of said spheres and said first end sphere also abutting said first end clamp and said second end sphere also abutting said second end clamp; whereby
i. said spheres are held abutting each other;
j. a driving screw having threads of a width about equal to the diameter of said spheres;
k. a motor, with said motor being rotatably connected to said driving screw;
l. an opening in said tube;
m. said driving screw being partially inserted through said opening into said tube with its axis of rotation lying parallel to the axis of symmetry of the length of said tube in which said opening is located and with said axis of rotation of said driving screw lying outside of said tube;
n. said driving screw being threadably engaged with said spheres; whereby
o. the rotation of said driving screw caused by said motor forces said spheres to move axially within said tube.

4,014,281

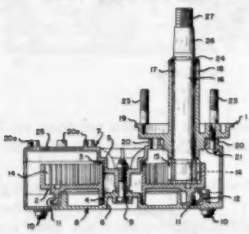
STEERING UNIT

James Frederick Hemens, Billericay, England, assignor to Teleflex Morse Limited, Basildon, England

Division of Ser. No. 504,483, Sept. 10, 1974, Pat. No. 3,954,022. This application Mar. 17, 1975, Ser. No. 558,752

Int. Cl.² B63H *25/10*

U.S. Cl. 114—144 R **14 Claims**



1. A ship's steering system motion transmitting unit comprising a housing, a cable wheel mounted within said housing, a shaft with a pinion thereon which makes driving engagement with said cable wheel, means connecting the shaft to a ship steering device, and a one-piece body which serves as a bearing support for said shaft and which also has a shroud portion providing a mounting means for mounting said unit to a support surface whereby when said unit is orientated with its housing lowermost, the shroud portion and mounting means are spaced below the upper region of said shaft and said bearing support therefor.

4,014,282

EXHAUST TUBE MOUNTING APPARATUS FOR OUTBOARD MOTORS

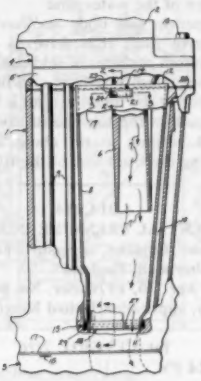
Delhardt K. Kollman, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,305

Int. Cl.² B63H *21/34*

U.S. Cl. 115—.5 E **11 Claims**

1. In an outboard motor having a power head attached to the upper end of a drive shaft housing and a lower propeller unit attached to the lower end of the drive shaft housing, said drive shaft housing having a bottom discharge opening in the lower end thereof, an exhaust tube mounted in said drive shaft housing with the lower end located within said drive shaft housing and in alignment with the discharge opening of said drive shaft housing, the upper end of the exhaust tube and the drive shaft housing having mating projections and receptacles,



said drive shaft housing including a horizontal support wall upon which the exhaust tube rests to support the upper end of the exhaust tube on the drive shaft housing, said powerhead having means resting on said exhaust tube and clamping said tube to said support wall, and a resilient mount secured within said discharge opening and locating the lower end of the exhaust tube in upwardly spaced relation to the lower propeller unit.

4,014,283

WATERCRAFT, PARTICULARLY FOR WATERSPORTS

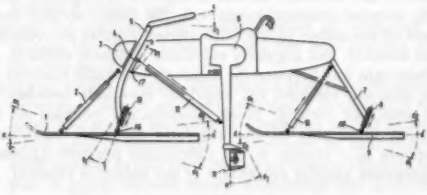
Ferdo Crnogorac, Marsala Tita 105, Bosanski Brod, Yugoslavia

Filed Nov. 18, 1975, Ser. No. 632,986

Claims priority, application Yugoslavia, Nov. 19, 1974, 3067/74

Int. Cl.² B63B *35/72*

U.S. Cl. 115—70 **5 Claims**



1. A watercraft comprising, in combination:
an elongated displacement flotation body having at least one seat thereon for a rider, said body having its longitudinal axis extending generally parallel to the direction of forward travel;
front and rear skis disposed below said body in tandem arrangement, said front ski being steerable;
spring means connecting said rear ski to said body so as to provide a cushioned connection between them;
a bushing pivotally mounted on said body near the front end thereof, said bushing being tiltable about a transverse horizontal axis;
a steering column extending downwardly and forwardly through said bushing and rotatable therein, the bottom

end of said steering column being pivotally attached to said front ski intermediate the ends thereof, whereby the ski can swing through an arc between a first position generally parallel to the direction of travel, and a second position inclined forwardly and upwardly;

a resilient strut connected at one end to said front ski near the forward end thereof, and at its other end to said steering column so as to maintain the front ski at a more-or-less constant angle of attack when the craft is running on the surface of the water; and

a motor mounted in said body and having a downwardly extending drive shaft that drives a propeller located below the bottom surfaces of said skis;

said front ski being movable from said first position to said second position at the time the craft is being launched, by a rearward pull on the top end of said steering column, causing said bushing to tilt about its pivot axis and thereby raising the front end of the front ski.

4,014,284

DIFFERENTIAL PRESSURE INDICATORS

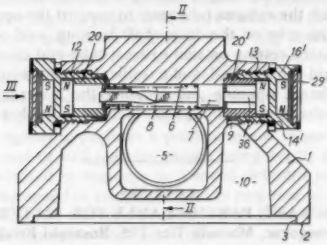
Brian Read, Chester, England, assignor to Fawcett Engineering Limited, Bromborough, England

Filed Apr. 30, 1976, Ser. No. 681,954

Claims priority, application United Kingdom, May 6, 1975, 19051/75

Int. Cl.² G01L *7/16*

U.S. Cl. 116—114 PV **5 Claims**



1. A differential pressure indicator including a piston mounted for sliding movement in a bore, the differential pressure to be measured being in use supplied across the opposite faces of the piston, and resilient biasing means urging the piston in the direction of decreasing differential pressure, wherein the indicator further comprises an angularly moveable member interconnected with the piston so that movement of the piston in the bore causes angular movement of said member, and angularly moveable indicator element, and a fluid-tight wall between the angularly moveable member and the indicator element, the angularly moveable member and the indicator element being magnetically coupled so that angular movement of the angularly moveable member in response to a change in the differential pressure causes an appropriate angular movement of the indicator element.

4,014,285

MEMO DEVICE

Charles W. Davis, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 13, 1976, Ser. No. 686,231

Int. Cl.² G09F *19/06*

U.S. Cl. 116—131 **1 Claim**

1. A memo device, comprising

a substantially plate-like member;

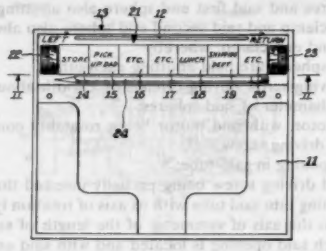
guide means along an edge of the member;

a plurality of blocked spaces on the member extending alongside the guide means;

a pointer movably mounted in the guide means for manually selecting a desired one of the blocked spaces;

a first knob rotatably mounted on the member on one side of the blocked spaces in a plane substantially perpendicular to the plane of the member, said knob having marks around its circumference indicating the hours and minutes of a day;

a second knob rotatably mounted on the member on the opposite side of the blocked spaces in a plane substantially perpendicular to the plane of the member, said



second knob having marks around its circumference indicating the hours and minutes of a day; and

a writing instrument on the member for writing messages in the blocked spaces whereby the pointer is movable to a selected blocked space bearing a pertinent message, the first knob is settable to indicate a time of departure relative to the pertinent message and the second knob is settable to indicate a time of return relative to said pertinent message.

4,014,286

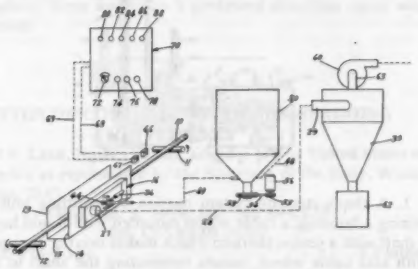
HOT PRODUCT MARKING SYSTEM

Donald E. De Zurik, 17325 N. 25th Ave., Wayzata, Minn. 55391

Filed Apr. 25, 1975, Ser. No. 571,631

Int. Cl.² B05C *19/00*

U.S. Cl. 118—2 **10 Claims**



1. An apparatus for marking hot elongated longitudinally traversing rolled metal products of varying sizes for identification as said products emerge from a previous hot processing operation, said apparatus comprising:

A. a marking station immediately adjacent to the flow path of hot metal traveling from a previous hot processing operation, said marking station being disposed downstream from said previous operation and including:

1. wall means partially enclosing the sides of said flow path, the resulting partial enclosure being open at the ends and substantially unobstructed at the top,

2. spray means directed through said wall means at said flow path, and

3. an exhaust duct through said wall means,

B. a supply vessel adapted to contain a quantity of thermosensitive powdered marking material, said vessel including powder propelling means,

C. means for connecting said propelling means to a source of gas under pressure,

D. means for connecting said spray means to said supply vessel,

E. suction means for withdrawing excess marking material connected to said exhaust duct, and

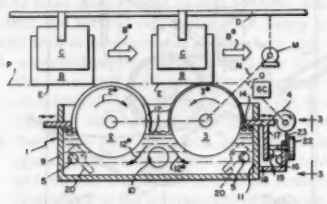
F. sensor actuated automatic control means to operate said spray means and exhaust means upon demand, including sensor means disposed adjacent to said flow path upstream from said marking station and operatively connected to control means to intermittently operate said spray means and suction means.

4,014,287

HIGH SPEED FLUID APPLICATOR

Harold W. Green, Framingham, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Filed Aug. 4, 1975, Ser. No. 601,649
Int. Cl.² B05C *1/02*
U.S. Cl. 118—7 **6 Claims**



1. Apparatus for applying adhesive to the parallel edges of sheets fed by a conveyor through a gluing station plane, comprising

an adhesive container with parallel sidewalls extending from opposite endwalls,

two applicator rolls for transporting adhesive from the container to the gluing plane, the rolls substantially completely spanning the sidewalls to bar adhesive flow between the ends of the rolls and the sidewalls,

each roll rotating counter to the other and through the adhesive toward an end wall and being the sole means to pump a head of adhesive between the roll sidewalls and end wall, the second roll rotating counter to the feed of the sheets,

a doctor blade extending from each end wall and spanning the sidewalls, the blade being movable between a position substantially in contact with the full length of the roll and a position spaced from the roll, the blade substantially doctoring the roll dry of adhesive in its roll contacting position and in its retracted position allowing transport of adhesive by the roll from the head directly to the gluing plane, and

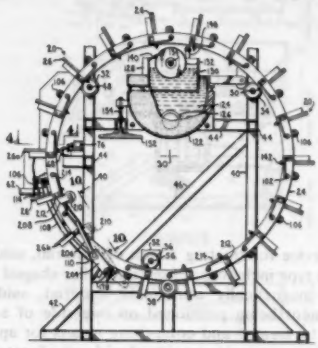
timing means linked to at least one of the doctor blades for retracting the one blade from contacting position to spaced position as the sheets are just past the gluing station, so that the leading end of the sheet edges is substantially dry of adhesive and a film of adhesive with a clearly defined leading edge is applied to the sheet edges rearwardly of the dry end.

4,014,288

PADDING MACHINE

Lorren F. Ludlum, Fredonia, Kans., assignor to William J. Falstad; Kenneth L. Mellon and Russel Spohn, all of Fredonia, Kans., part interest to each

Filed June 2, 1975, Ser. No. 582,682
Int. Cl.² B05C *1/02*
U.S. Cl. 118—6 **14 Claims**



1. A padded machine comprising:

a carrier rotatable about a generally horizontal axis;

a plurality of feeder units each adapted to receive a multileaved product such as a pad or book, said units being mounted on said carrier, radially spaced from said axis, and spaced from one another at angular intervals about said axis;

drive means coupled with said carrier for incrementally rotating the latter to advance individual units in succession in a circular path from a loading position to a delivery position and back to said loading position,

each of said units being provided with means for releasably holding a product loaded thereinto in a disposition in which an edge of the product to be glued extends substantially parallel to said axis of the carrier;

control means operably coupled with said drive means and responsive to loading of the unit at said loading position for actuating the drive means to cause said carrier to rotate one increment and advance the next unit to the loading position;

means adjacent said path for applying glue to said edge of the product in each unit after advancement from said loading position; and

means for operating the holding means of each unit to release the glued product when the unit reaches said delivery position,

said glue applying means comprising a gluing station located between a pair of adjacent, successive positions of said units, said station including an applicator having an elongated zone of contact for engagement by said edge of each product as said units pass in succession between said pair of positions, and means supporting said applicator with said zone thereof extending substantially parallel to said axis, whereby the entire length of the advancing edge to be glued simultaneously engages the applicator at said zone,

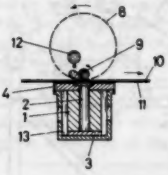
said applicator being a rotatable roll having an outer surface presenting said zone and over which glue is spread, and said supporting means mounting said roll with its axis of rotation extending substantially parallel to said axis of the carrier,

said gluing station further including an elongated stripper wire extending parallel with said axis of the roll and spaced from said zone in the direction of advancement of said units, and means mounting said wire in closely spaced relationship to the glued edge of each advancing product for removal of excess glue therefrom.

4,014,289
DEVICE FOR TREATING A WEB

Johannes Zimmer, Ebentalerstrasse 133, A-9020 Klagenfurt, Austria

Filed Sept. 12, 1975, Ser. No. 612,742
Claims priority, application Austria, Sept. 12, 1974, 7400/74
Int. Cl.² B05C *17/04*
U.S. Cl. 118—213 **2 Claims**



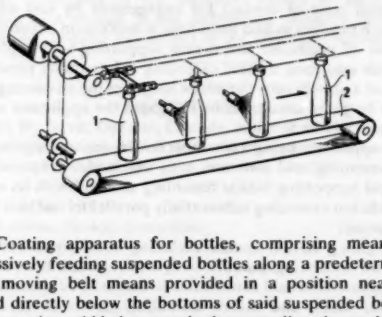
1. In a device for treating a web of material, said device being of the type including at least one roller-shaped element formed of magnetically attractable material, said roller-shaped element being positioned on one side of a web of material to be treated and comprising means for applying a treating substance to said one side of said web of material, and a magnetic element positioned on the opposite side of said web of material, said magnetic element including a series of electromagnets arranged one after the other in a longitudinal direction of the magnetic element across the width of the web of material, said magnetic element comprising means for attracting said roller-shaped element and thereby forcing said roller-shaped element against one side of said web of material; the improvement comprising:

means connected to said electromagnets for selectively reversing the direction of current through the coils of at least a portion of said electromagnets to selectively change the polarity alignment of said electromagnets from a first polarity alignment of alternating polarity between adjacent said electromagnets and a second polarity alignment wherein two adjacent electromagnets are of the same polarity.

4,014,290
COATING APPARATUS FOR BOTTLES

Kunio Obara, and Masaru Sanda, both of Chiba, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1974, Ser. No. 446,463
Claims priority, application Japan, Feb. 28, 1973, 48-25316[U]
Int. Cl.² B05C *5/00*
U.S. Cl. 118—301 **2 Claims**

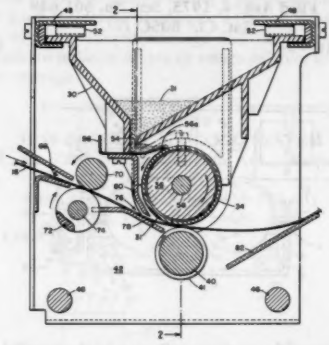


1. Coating apparatus for bottles, comprising means for successively feeding suspended bottles along a predetermined path. moving belt means provided in a position near but spaced directly below the bottoms of said suspended bottles, means moving said belt means in the same direction and at the same speed as said bottles, and means for spraying a coating material onto the exterior sidewalls of said bottles as said bottles and said belt means move together along said path, whereby said belt means acts to prevent the application of said sprayed material to said bottoms of said bottles, said moving belt means being sufficiently close to said bottle bottoms that moving of said belt means in said direction at a different speed than said bottles would result in wiping of sprayed paint from said belt means onto said bottles.

4,014,291
IMAGE DEVELOPING SYSTEM

Austin E. Davis, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Jan. 26, 1976, Ser. No. 652,172
Int. Cl.² G03G *13/00*
U.S. Cl. 118—657 **13 Claims**



1. Apparatus for developing with a polarized, magnetically attractable, one component toner material a latent electrostatic image formed on a coated photoconductive paper, comprising, in combination,

a toner support member having a smooth outer surface,

means for generating a substantially longitudinally uniform magnetic field at said outer surface of said support member,

means for dispensing a layer of said toner material of substantially uniform thickness on said outer surface of said support member,

means for preventing an electrical flow between said support member and said paper, and

means for moving said layer of toner material from said dispensing means to a deposit zone where said support member is spaced from said paper so that an electrostatic attractive force between said toner material and the latent electrostatic image exceeds the force of said magnetic field that tends to hold the toner material on the outer surface of said support member thereby causing said toner material to deposit selectively on said latent image,

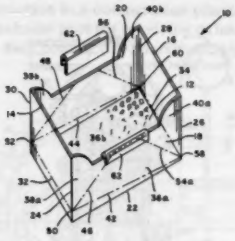
said spacing being sufficiently large to avoid contact between said paper and said layer of toner material disposed on said support member, and

said electrical flow prevention means eliminating electrical flow induced variations in the deposit of said toner material from said support member to said latent image.

4,014,292
COLLAPSIBLE AND DISPOSABLE SANITARY PET LITTER CONTAINER

Warren J. Coughlin, 600 Old Stamford Road, New Canaan, Conn. 06840, and Renato D. Fecci, 587 High Ridge Road, Stamford, Conn. 06905

Filed May 7, 1976, Ser. No. 684,155
Int. Cl.² B65D *5/08*
U.S. Cl. 119—1 **7 Claims**



1. A collapsible and disposable sanitary pet litter container comprising:

a carton of sheet material having an open rectangular configuration for receiving pets and a closed wedge-shaped configuration for storage and disposal, said carton including

A. a bottom;

B. first and second end walls foldable inwardly toward each other over said bottom on mutually parallel end fold lines also parallel to said bottom; and

C. first and second side walls, each being joined to one end wall at two corners, and each having

1. a central portion which is foldable inwardly toward the other side wall central portion over said bottom on a lateral side fold line parallel to the other lateral side fold line but not parallel to said bottom, and

2. two wing portions, each being foldable outwardly against said central portion on one fold line corresponding to one corner and on an acute side fold line originating at the intersection of said one corner with said lateral side fold line and bisecting the angle defined by said intersection.

4,014,293
FISH EGG INCUBATOR

Frederick H. Salter, Juneau, Alaska, assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,909
Int. Cl.² A01K *61/00*
U.S. Cl. 119—3 **10 Claims**

1. A fish egg incubator comprising:

a. a trough having two ends and containing a rugose layer at its bottom;

b. a screen or screens in said trough located directly above said rugose bottom layer and spaced therefrom and adapted to have fish eggs placed thereon;

c. the said trough and screens forming a first trough and screen assembly;

d. the screen having openings slightly smaller than the fish eggs whereby the latter are retained in said screen;

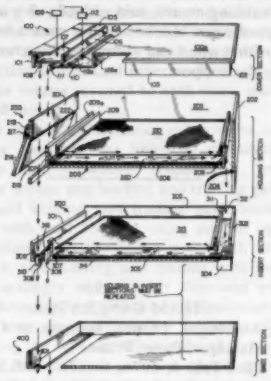
e. first housing means having sides capable of substantially shielding out light for housing said trough and screen combination; and

f. access means in one of the sides of said housing means for providing access to its interior;

g. baffle means near one end of said trough to direct a flow of water through and along said rugose layer and whereby water flows through and along said screen;

h. water overflow means at the other end of said trough, whereby fry resulting from the incubated eggs pass over the water overflow means;

i. means for directing a further flow of water on said fry; and

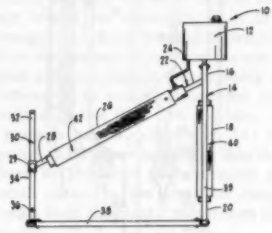


j. means comprising a vessel containing water for receiving the fry after they pass over the water overflow means.

4,014,294
CATTLE OILER

William P. Hovorak, 1023 W. 16th, Wellington, Kans. 67152

Filed Mar. 17, 1976, Ser. No. 667,490
Int. Cl.² A01K *29/00*
U.S. Cl. 119—157 **11 Claims**



1. A cattle oiler for the treating of livestock, the oiler comprising:

a vertical support having an upper portion, a center portion, and a lower portion;

an angular support having an upper portion, a center portion, and a lower portion, the upper portion of said angular support attached to the upper portion of said vertical support, said angular support extending outwardly and downwardly from said vertical support;

a vertical slide support, the lower portion of said angular support mounted on said slide support;

first rubbing means tiltably mounted on said vertical support;

second rubbing means tiltably mounted on said angular support;

an oil reservoir mounted on said vertical support;

first valve means attached to the upper portion of said vertical support and disposed adjacent said first rubbing means, said first valve means communicably connected to said reservoir for feeding oil therefrom to said first rubbing means, said first valve means held in a closed position, said first valve means in use held in an open position

when said first rubbing means is tilted on said vertical support; and

second valve means attached to said second rubbing means and disposed adjacent the upper portion of said angular support, said second valve means communicably connected to said reservoir for feeding oil therefrom to said second rubbing means, said second valve means held in a closed position, said second valve means in use held in an open position when said second rubbing means is tilted on said angular support.

4,014,295

STEAM GENERATOR

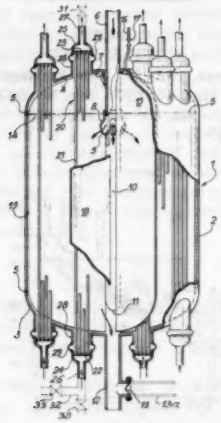
Noél Lions, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 4, 1976, Ser. No. 655,243

Claims priority, application France, Feb. 12, 1975, 75.04334

Int. Cl.² F22B *1/06*

U.S. Cl. 122—32 **13 Claims**



1. A steam generator comprising a closed outer casing of revolution about an axis and containing liquid metal which is circulated within said casing, and a plurality of tube bundles traversed by water in the liquid state to be converted to steam by exchange of heat with the liquid metal, the tubes in each bundle being adapted to pass through the casing and connected at the end of said casing by means of tube-plates to two separate headers respectively for the admission of water and discharge of steam, said tube bundles being arranged in spaced relation within the casing so as to constitute independent modules extending parallel to the axis of said casing, liquid metal being supplied to the casing along its axis through a single central tube so as to fill said casing to a given level, wherein said supply tube is provided with distribution orifices for the flow of liquid metal into adjacent compartments formed in the casing by means of radial partitions extending from the central tube in planes which contain the axis of the casing, each compartment being traversed by at least one tube bundle, the radial partitions being such as to form with the internal surface of the casing a small gap in order to permit a communication between the adjacent compartments and to equalize the level of liquid metal within said compartments.

4,014,296

PLANT FOR BURNING FUELS PRODUCING A LIQUID COMBUSTION RESIDUE

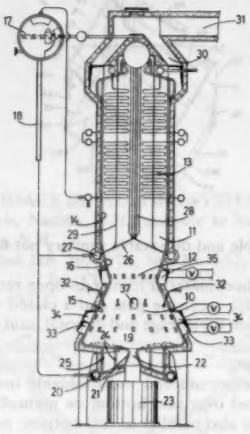
Ingmar Astrom, Stenungsund, Sweden, assignor to Gotaverken Angteknik AB, Goteborg, Sweden

Filed Sept. 30, 1975, Ser. No. 618,161

Claims priority, application Sweden, Oct. 23, 1974, 7413315

Int. Cl.² F22B *21/00*; F23G *7/04*

U.S. Cl. 122—235 P **5 Claims**



1. A plant for burning fuels which produce a liquid combustion residue, which plant includes a furnace having a basically circular cross section and a vertical axis, and being defined by a tube-membrane shell formed by water cooled tubes interconnected by welded fins, the improvement of a lower furnace chamber being upwardly defined by a truncated conical surface

an upper final combustion chamber, aligned with said lower combustion chamber and being downwardly defined by a reversed, truncated conical surface,

a restricted gas passage formed by the merging of said truncated conical surface and said reversed, truncated conical surface,

a bottom structure in said lower combustion chamber formed by tubes of said shell membrane being bent radially inwards,

a discharge opening, located centrally in said bottom and formed by some of said radially directed tubes being further bent back towards said shell and

a screen of tubes within said final combustion chamber, just upstream of said restricted gas passage, the tubes of said screen being sparse along the shell of the final combustion chamber, but very close together in the centre thereof, just above the discharge opening, nozzles for the supply of final combustion air being located adjacent to the restricted gas passage and arranged to impart a forceful rotary movement to the arising gases.

4,014,297

ROTARY ENGINE COMBUSTION CONTROL ARRANGEMENT

Edward A. Rishavy, Warren, and James H. Currie, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

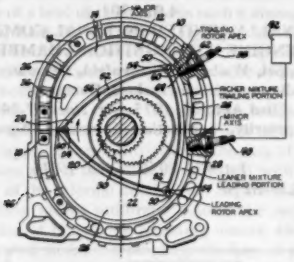
Filed May 7, 1975, Ser. No. 575,211

Int. Cl.² F02B *53/12*

U.S. Cl. 123—8.09 **10 Claims**

1. A rotary internal combustion engine comprising housing means having an inner peripheral wall and oppositely facing

side walls, a rotor rotatably mounted in said housing means between said side walls with apexes that remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively defining a plurality of chambers spaced around said rotor between leading and trailing apexes that expand and contract while moving with said rotor, an apex seal mounted on each said rotor apex for engaging said inner peripheral wall to provide sealing between adjacent chambers, said housing means having an intake port for delivering a combustible mixture to said chambers as they expand in an intake phase prior to their contraction in a compression phase, said housing means having an exhaust port for receiving exhaust gases from said chambers as they contract in an exhaust phase following



their expansion in a power phase, a spark plug mounted on said housing means with its spark electrode located in an ignition opening in said peripheral wall so as to be exposed to a trailing portion of the passing chambers at the beginning of their power phase, said ignition opening further being located in a zone where the trailing apex seal of the passing chambers experiences a pressure differential which increases in the direction of rotor rotation and is substantially below the peak pressure differential reached and an ignition system providing said spark plug with an arc of prolonged duration approximating the time available from start of ignition to when the trailing apex seal of the passing chambers reaches the ignition opening.

4,014,298

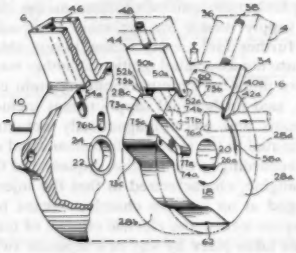
CONCENTRIC ROTARY ENGINE

John E. Schulz, 10707 Moorpark, Apt. 204, North Hollywood, Calif. 91602

Continuation-in-part of Ser. No. 505,062, Sept. 11, 1974, Pat. No. 3,921,596. This application Mar. 17, 1975, Ser. No. 558,845

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.27 **30 Claims**



1. A rotary engine of the internal combustion type, comprising:

a rotor housing having an inner surface which defines a hollow, cylindrical chamber;

a rotor concentrically disposed within said cylindrical chamber;

said rotor having oppositely disposed sidewalls and a perimetrical cam surface which defines, in the direction of axial rotation, power lobe means, inlet pocket means, operating lobe means and combustion pocket means, with the transverse width of said cam surface being substantially equilevel;

said rotor being in slidable, sealable and rotatable engagement with the inner surface of said rotor housing except for said inlet and combustion pocket means which are in spaced relationship to said inner surface;

power transfer means secured to said rotor and extending beyond said housing;

a leading gate system and a trailing gate system, said leading and trailing gate systems being in correlative spaced relationship and, including, respectively, leading and trailing gate means and leading and trailing gate housings therefor, said leading and trailing gate housings being integrated with said rotor housing and in open mouth communication with the transverse width of the rotor cam surface, said leading and trailing gate means being yieldably, sealingly and slidably disposed within their respective housings and provided with substantially equilevel rotor engaging surfaces for sealingly slidably and fully engaging the substantially equilevel transverse width of the rotor cam surface, with the opposing lateral sidewalls of each of the leading and trailing gates being sealingly and slidably engageable with their laterally adjacent, inner surfaces of the rotor housing;

combustion chamber means recessed in the inner surface of said rotor housing between said leading and trailing gate means;

operative section means delimited by the leading and trailing gate means and the combustion chamber means disposed therebetween;

intake reservoir means defined by the portion of the rotor inlet pocket means in cyclic cooperation and communication with the operative section means;

expansion receiver means defined by the portion of the rotor combustion pocket means in cyclic cooperation and communication with the operative section means;

intake passage means for conveying fluid to the intake reservoir means and exhaust passage means for withdrawing fluid from the expansion receiver means;

said intake and exhaust passage means being disposed in spaced relationship to provide sequential and substantially mutually exclusive fluid flow systems;

said intake passage means comprising: (a) intake port means disposed in the rotor housing within the minimum radius defined by the rotor pocket means and (b) entrance conduit means in the rotor for extending fluid communication from the intake port means to the intake reservoir means;

said exhaust passage means comprising: (a) exhaust port means disposed in the rotor housing within the minimum radius defined by the rotor pocket means and (b) exit conduit means in the rotor for extending fluid communication from the expansion receiver means to the exhaust port means; and

means for initiating combustion of combustible fluid in said combustion chamber means.

4,014,299

METHOD AND DEVICE FOR RESTRAINING NITROGEN OXIDE PRODUCTION IN COMBUSTION GAS OF INTERNAL COMBUSTION ENGINES

Hidetsugu Kubota, No. 4-9, 3-chome, Motomachi, Kameda, Naka Kanbara, Niigata, Japan

Filed Jan. 20, 1976, Ser. No. 650,671

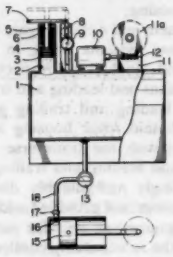
Claims priority, application Japan, Jan. 23, 1975, 50-10304

Int. Cl.² F02D *18/00, 47/00*

U.S. Cl. 123—25 P **3 Claims**

1. In combination with at least one cylinder of an internal combustion engine, an apparatus for substantially preventing

the formation of nitrogen oxides when a mixture of fuel and air is combusted in the cylinder, the apparatus comprising a tank for containing water, water evaporating and ejecting means communicating with the interior of the cylinder below the dead bottom position of the piston in the cylinder for injecting steam into the cylinder, a conduit communicating between the tank and the evaporating and ejecting means for providing water to the evaporating and ejecting means for conversion to steam and injection into the cylinder and means for regulating the water pressure in the tank in a range so



related to the pressures developed in the cylinder of the engine that simultaneously with the drawing into the cylinder of the mixture of fuel and air, steam is injected into the cylinder and mixes with the mixture of fuel and air, then the injection of steam into the cylinder ceases due to the increased pressure produced in the cylinder by the combustion of the mixture and, to complete the cycle, steam is again injected into the cylinder beginning during the exhaust stroke and continuing during the intake of the fuel and air mixture due to the lower pressure in the cylinder during these stages.

4,014,300

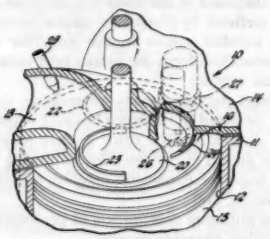
RICH-CORE STRATIFIED CHARGE SPARK IGNITION ENGINE WITH RICH MIXTURE SCOOP

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1975, Ser. No. 636,748

Int. Cl.² F02B *17/00, 31/02*

U.S. Cl. 123—30 C **3 Claims**



1. The combination in a four-stroke cycle internal combustion engine of means defining a closed end cylinder

a piston reciprocable in said cylinder and defining therewith a variable volume combustion chamber at said cylinder closed end

inlet and exhaust ports connecting with said cylinder at said closed end

inlet and exhaust valves respectively associated with said ports and operable to close and open their connections with said cylinder, said inlet port and its associated inlet valve being arranged to direct incoming air in a swirling motion around the axis of said cylinder,

a scoop extending downwardly from said cylinder closed end toward said piston, said scoop being spaced between the axis and wall of said cylinder and curved in a manner generally parallel with the curvature of said wall from a point adjacent said inlet valve toward said exhaust valve in the direction of inlet air flow, thus separating the swirling air mass into central core and annular peripheral portions,

a spark plug in said cylinder defining means and having a spark gap in said combustion chamber adjacent the inner side of said scoop in said central core portion and

means to establish in said central core portion of the combustion chamber a rich combustible fuel-air mixture for ignition by said spark plug.

4,014,301

EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE WITH IGNITION CHAMBER

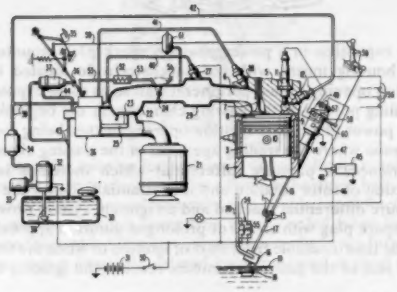
Robert Happel, Waiblingen-Bittenfeld, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 14, 1975, Ser. No. 567,945

Claims priority, application Germany, Apr. 17, 1974, 2418475

Int. Cl.² F02B *19/10, 19/16*

U.S. Cl. 123—32 SP **24 Claims**



1. An internal combustion engine with applied ignition which includes an ignition distributor housing means, an ignition distributor shaft, at least one main combustion space means and one ignition chamber means each coordinated to a respective main combustion space means and connected therewith by way of an overflow channel means, the ignition chamber means being provided with a spark plug means and an injection valve means, a fuel supply means for supplying fuel to the main combustion space means including control means for controlling the quality of fuel supplied to the main combustion space means over a relatively large load range of the internal combustion engine, a further fuel supply means for supplying fuel to the ignition chamber means independent of the fuel supply means for the main combustion space means, said further fuel supply means is operable so as to inject a fuel into the associated ignition chamber means during a low pressure phase of the corresponding main combustion space means, said further fuel supply means including injection line means and electromagnetically actuatable valve means coordinated to the injection line means and electrically controllable according to the ignition sequence of the internal combustion engine, characterized in that the injection valve means arranged at an ignition chamber means includes an actuating magnet means, the electric control of the actuating magnet means takes place by way of a separate switch means coordinated to each injection valve means, a cam means is arranged on the ignition distributor shaft and rotates at a speed proportional to the engine rotational speed for actuating said switch means, all of said switch means are arranged in the ignition distributor housing means circumferentially substantially uniformly distributed in the sequence of the ignition sequence of the engine about the axis of rotation of the cam

means, each of the switch means includes a fixed contact means and a movable contact means movable by the cam means and provided with a cam follower means, the movable contact means being displaced in the direction toward the cam surface in the closing sense and being under a spring prestress in the closing direction, the cam means includes over about 290° to 390° of its circumference a substantially uniform raised cam portion lifting the movable contact means from the fixed contact means by engagement with the cam follower means and is provided within an area of the remaining cam circumference with an approximately V-shaped notch enabling the movable contact means to drop onto the fixed contact means, each of said switch means is variable in its spacing to the cam surface by a switch adjusting means such that a change in the distance of the switch means takes place as a function of a load of the engine in such a manner that with an increasing load the corresponding injection valve means electromagnetically controlled by the corresponding switch means is open for a shorter period of time, the switch adjusting means is so constructed that with an increasing load, at least the fixed contact means of the switch means is adjustable in a direction toward the cam surface, the switch adjusting means is rotatably supported concentrically to the axis of rotation of the cam means and is operatively connected with a load adjusting lever of the internal combustion engine such that said switch adjusting means uniformly adjusts the switch means during rotation of the switch adjusting means, and in that a vacuum operated means is arranged in the flow of power of an adjusting linkage for the switch adjusting means, which is held in one extreme position by a spring force and is adapted to be moved away from said extreme position by vacuum, said vacuum means being operatively connected with a suction pipe downstream of a throttle valve in such a manner that with an increasing vacuum, the switch means are displaced in the direction toward smaller closing periods.

4,014,302

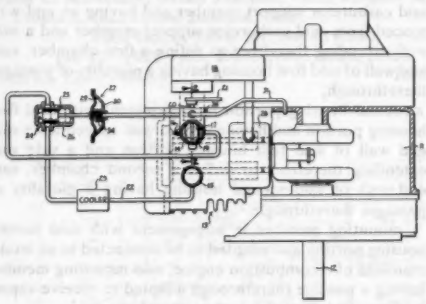
DEVICE TO REDUCE THE NITROGEN OXIDE CONTENT IN THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

George F. Houston, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation of Ser. No. 558,205, March 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 453,647, March 21, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 648,119

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **14 Claims**



1. In combination with an internal combustion engine having a fuel mixture inlet, an exhaust gas outlet and a crankcase in which, when the engine is running, a pulsating negative pressure exists that varies in magnitude with changes in engine speed, said pulsating negative pressure providing a power source of correspondingly varying magnitude, means for reducing the nitrogen oxide content of the exhaust gas emitted by the engine, comprising:

A. duct means through which said fuel mixture inlet is communicable with said exhaust gas outlet;

B. adjustable flow metering means associated with said duct means to regulate communication of said fuel mixture inlet means with said exhaust gas outlet; and

C. power translating means operatively connected with said power source to be responsive thereto and with said adjustable flow metering means to adjust the latter in accordance with the response of said power translating means to changes in the magnitude of said power source and thereby coordinate the admission of exhaust gas to said fuel mixture inlet with changes in the operating condition of the engine.

4,014,303

DEVICE FOR IMPROVED EFFICIENCY IN INTERNAL COMBUSTION

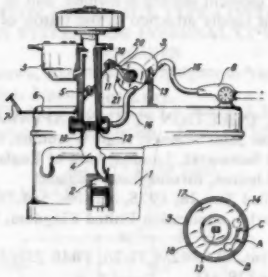
Guglielmo Aiti, Via Fratelli Spazzoli 33, Forli, Italy

Filed Apr. 23, 1975, Ser. No. 570,793

Claims priority, application Italy, May 7, 1974, 22386/74

Int. Cl.² F02M *23/04*

U.S. Cl. 123—124 R **4 Claims**



1. In a device for improved efficiency in internal combustion engines of the type having a carburetor adapted for supply of an air-fuel mixture to the intake manifold of the cylinders and of throttle valve between the carburetor and the intake manifold, the improvement comprising an air compressor, a passage for admitting air from the compressor into the intake manifold of the engine downstream of the carburetor, regulator means having a variable opening for controlling the air flow from the compressor to said passage, and means rotatably connected to the throttle and acting upon said regulator means for controlling the degree of opening thereof, said regulator means and said means acting thereon being constructed and arranged to provide flow of a predetermined amount of air to said passage when the throttle valve is at a minimum open position, then to provide to said passage a decreased flow of air to an amount less than the predetermined amount as the throttle valve is opened and then to provide a gradually increasing amount of air as the throttle is further opened reaching an amount greater than said predetermined amount and then providing a substantially increased flow of air at maximum opening of the throttle valve.

4,014,304

INJECTION PUMPS FOR DIESEL ENGINES

Pier Franco Rivolo, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed June 24, 1975, Ser. No. 589,812

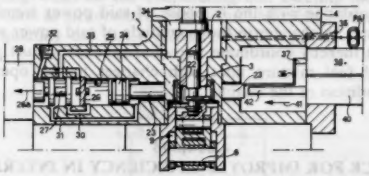
Claims priority, application Italy, Sept. 2, 1974, 69666/74

Int. Cl.² F02M *37/00*

U.S. Cl. 123—139 E **6 Claims**

1. Injection pump for diesel engines of the type comprising a pump body having a fuel inlet and a seating in which a rotatably adjustable pumping element is slidable, an auxiliary pump, a feed chamber operatively associated with said seating

and adapted to receive fuel under pressure from said auxiliary pump, a control rod for regulating rotation of said pumping element, proportional electrohydraulic actuator means carried on the pump body for displacing the control rod longitudinally, said actuator means including an actuator cylinder, a distributor valve controlling the feed and exhaust of the fluid under pressure selectively to and from the actuator cylinder,



an electromagnet controlling said distributor valve, a piston slidable in said cylinder and connected to the control rod,

wherein the improvement consists in that the actuator cylinder and the seating of the distributor valve are machined directly in the pump body in which the said at least one pumping element seating is formed, and in that the control rod is rigidly attached to the piston of the actuator cylinder.

4,014,305

FUEL INJECTION PUMPING APPARATUS

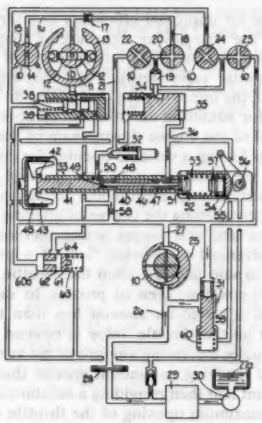
Robert Thomas John Skinner, High Wycombe, and Stanislaw Jan Antoni Sosnowski, London, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Jan. 28, 1975, Ser. No. 544,785

Claims priority, application United Kingdom, Feb. 1, 1974, 04681/74

Int. Cl.² F02M *59/20;* **F04B** *23/12*

U.S. Cl. 123—139 AQ **8 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising an injection pump for supplying fuel in timed relationship to an associated engine, a fluid pressure operable element for controlling the timing of delivery of fuel to the engine, a feed pump, a conduit connecting the feed pump and the injection pump, the feed pump supplying fuel to the injection pump during the filling strokes of the injection pump, throttle means in said conduit for controlling the amount of fuel supplied by the feed pump to the injection pump, a first orifice disposed in said conduit upstream of said throttle means, a passage branching off said conduit from intermediate said first orifice and said throttle means, a second orifice disposed in said passage, valve means disposed in said passage downstream of said second orifice for controlling the pressure of fuel downstream of the second orifice so that it varies in accordance with the square of the speed at which the injection pump is driven, passage means through which the pressure intermediate said first and second orifices is applied to said element, a relief valve means for controlling the output pressure of the feed pump so that it varies substantially in accordance with the law $(N^2 + K)$ where N represents the speed at which the injection pump is driven and K is a constant, and further valve means including a variable orifice connected in parallel with said first orifice, said further valve means including a member responsive to the output pressure of the feed pump and arranged so that as the output pressure of the feed pump increases the effective size of the variable orifice is decreased.

4,014,306

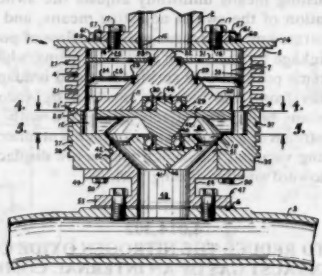
GASOLINE VAPORIZER APPARATUS

Elmer Wayne Ingersoll, Paola, Kans., assignor to Glenn L. Brown, Osawatomie, Kans.

Filed Apr. 14, 1975, Ser. No. 567,741

Int. Cl.² F02M *29/00*

U.S. Cl. 123—141 **12 Claims**



1. A gasoline vaporizer apparatus to be interposed between a carburetor and an intake manifold of a combustion engine and comprising:

a. a carburetor support member adapted to have a carburetor mounted thereon, said support member having a passage therethrough adapted to receive gasoline from the carburetor;

b. a first housing portion in engagement with said carburetor support member and having an end wall spaced from said carburetor support member and having an end wall spaced from said carburetor support member and a side wall extending therefrom to define a first chamber, said end wall of said first housing having a plurality of passages therethrough;

c. a second housing portion in engagement with said first housing portion and having an end wall spaced from said end wall of said first housing portion and a side wall extending therefrom to define a second chamber, said end wall of said second housing having a plurality of passages therethrough;

d. a mounting member in engagement with said second housing portion and adapted to be connected to an intake manifold of a combustion engine, said mounting member having a passage therethrough adapted to receive vaporized gasoline from the second chamber; and

e. a rotor having an axis of rotation and mounted in the second chamber for rotation in response to at least a partial vacuum effected by a combustion engine, said rotor having a plurality of passages therethrough adapted to receive gasoline from the passages through said end wall of said first housing and direct vaporized gasoline into the second chamber, said passages through said rotor each being radially outwardly spaced from the axis of rotation of said rotor, said passages through said rotor

each having an entrance portion alignable with a respective one of said passages through said end wall of said first housing portion, said passages through said rotor each having an exit portion intersecting said respective entrance portion and extending inwardly from said entrance portion thereof and communicating with said second chamber, said exit portion of each of said passages through said rotor being outwardly of said passages through said end wall of said second housing portion, said passages through said rotor each being generally L-shaped.

4,014,307

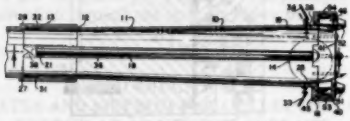
BARREL FOR BALL THROWING MACHINE

Tibor Horvath, 1877 E. 27th St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 543,554, Jan. 23, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 675,824

Int. Cl.² A63B *69/40*; **F41B** *11/00*; **F41F** *17/02*, *17/06*

U.S. Cl. 124—81 **13 Claims**



1. A barrel for a ball throwing machine which blows table tennis balls from said barrel comprising, in combination, a tubular barrel having a muzzle which flares laterally, one upper ball contact strip and one lower ball contact strip extending into said barrel and along said barrel to said muzzle, at least one of said contact strips elastically extending into said barrel, said contact strips contacting table tennis balls passing therebetween through said barrel so that said balls may randomly slip laterally from between said contact strips on reaching said laterally flared muzzle, and rigid deflectors disposed on each side of said laterally flared muzzle and projecting inward so that balls randomly slipping from between said contact strips in one lateral direction strike one of said deflectors to bounce and be deflected to a greater extent in the opposite lateral direction.

4,014,308

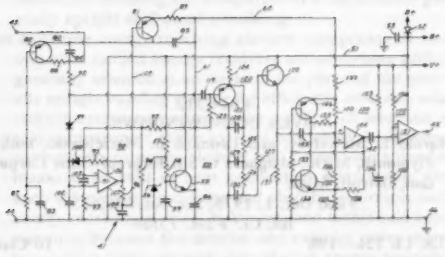
IGNITION SYSTEM AND APPARATUS AND METHOD FOR GENERATING TIMING SIGNALS THEREFOR

John C. Schweitzer, Grand Junction, Colo., assignor to Delta Products, Inc., Grand Junction, Colo.

Filed Oct. 3, 1974, Ser. No. 511,580

Int. Cl.² F02P *1/00*; **H03F** *1/00*; **H02K** *11/00*

U.S. Cl. 123—148 E **16 Claims**



1. Apparatus for generating timing signals for an engine ignition circuit or the like comprising:

inductive pickup means for generating an electrical signal corresponding to the movements of an engine or the like;

oscillator means operable to generate a carrier signal of a selected reference frequency and responsive to said electrical signal for producing an amplitude modulated output signal representative of the movements of an engine with which said apparatus is associated, said amplitude modulated output signal being said carrier signal amplitude modulated by said electrical signal, said oscillator means having an inductive-capacitive resonance circuit, said pickup means forming at least a part of the inductive portion of said resonance circuit;

means for controlling the operation of said oscillator means operable to bias said oscillator means in a linear mode of operation; and

means responsive to said modulated output signal for generating a series of uniform timing pulses corresponding to the movements of an engine with which said apparatus is associated to actuate an ignition circuit associated therewith, including means for inhibiting the outputting of said uniform timing pulses for a selected period of time following energization of said apparatus, said selected period of time corresponding in length to the time period necessary for the operation of said oscillator means to stabilize after energization.

4,014,309

CAPACITOR DISCHARGE TYPE CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

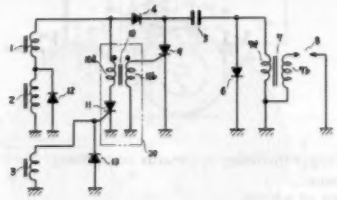
Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 16, 1974, Ser. No. 515,247

Claims priority, application Japan, Oct. 17, 1973, 48-117120

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CC **23 Claims**



1. A capacitor discharge type contactless ignition system for an internal combustion engine comprising:

a magneto generator including a stator, a rotor rotated in synchronism with rotation of an engine, a plurality of magnets mounted on and symmetrically disposed about said rotor for rotation therewith, a trigger magnet mounted on said stator, and a trigger core and at least one reversion core disposed adjacent said trigger magnet and rotated in synchronism with the rotation of the engine;

capacitor charging coil means mounted on said stator adjacent said rotor for generating alternating current having a first polarity half wave and a second polarity half wave in synchronism with the rotation of an engine in response to passage of said plurality of magnets past said capacitor charging coil means, one of said polarities being positive and the other polarity being negative during rotation produced by normal running of said engine and said one polarity being negative and said other polarity positive during reverse rotation of said engine;

capacitor means connected in series with said capacitor charging coil means for storing said first half waves of said alternating current;

switching means having a control gate and connected to said capacitor means;

an ignition coil having a primary winding connected in series with said capacitor means and said switching means and a secondary winding;

a spark plug connected to said secondary winding;

trigger coil means mounted on said stator adjacent said trigger magnet for generating reversion protecting signals and ignition signals in response to passage of said trigger and reversion cores past said trigger magnet; and

thyristor control means connected to said gate of said switching means, to said capacitor charging coil means and to said trigger coil means for rendering said switching means conductive to complete a discharge path through said ignition coil for discharging said capacitor means in response to said ignition signals and said first half waves during a normal running of said engine and for responding to said reversion protecting signals and said second half waves to cause said switching means to become conductive during a reverse rotation of said engine in order to prevent said reverse rotation.

4,014,310

TRANSPORTABLE TARGET THROWING APPARATUS

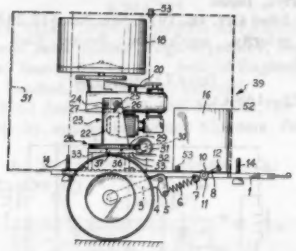
Jean-Michel Laporte, and Jean-Claude Laporte, both of Pont de la Brague, 06603 Antibes, France

Filed Mar. 27, 1975, Ser. No. 562,649

Claims priority, application France, Mar. 29, 1974, 74.11238

Int. Cl.² F41B *3/04*

U.S. Cl. 124—6 **14 Claims**



1. Target throwing apparatus comprising:

a frame;

a pair of wheels;

axle means mounted from said frame for supporting said wheels;

means for mounting each of said wheels on said axle means, said mounting means permitting adjustment of said wheels between two positions, said mounting means each comprising:

a crank, said crank being pivotally mounted on said axle means and having a pair of arms extending outwardly from said pivot connection to said axle means, the free end of a first of said crank arms being connected to a wheel whereby said wheel is rotatably coupled to said crank first arm; and

elastic means for coupling the second arm of said crank to said frame, said elastic coupling means permitting upward retraction of said wheel to a non-ground engaging position;

target throwing means for launching frangible targets into the air, said target throwing means being mounted on said frame, said target throwing means including a throwing arm and means for delivering targets to the throwing arm, said throwing means further including means for controlling the operation of said throwing arm to cause targets to be released for flight;

means mounted on said frame for immobilizing said frame with respect to the ground; and

protective cover means for said target throwing means, said protective cover means being of rigid construction and supported on said frame, said protective cover means functioning as a complete cover during transportation, and being partly removable from the frame for unobstructed operation of the apparatus.

4,014,311

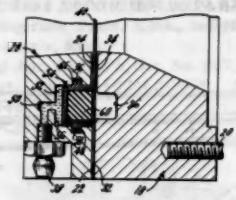
HYDRAULIC BLADE MOUNT

Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Aug. 19, 1975, Ser. No. 605,856

Int. Cl.² B28D *1/04*

U.S. Cl. 125—15 **9 Claims**



1. An improvement in a blade mounting and tensioning apparatus, said apparatus including first and second annular clamping members, means for clamping the periphery of a blade between said clamping members, an annular fluid channel within said first clamping member located radially inward of said clamping means and having an opening therein confronting one side of said blade, an annular recess channel within said second clamping member radially aligned with said annular fluid channel and having an opening therein confronting the other side of said blade, a deformable gasket within said annular fluid channel opening, a fluid within said annular fluid channel, said gasket being constructed and arranged to seal said fluid within said annular fluid channel against contact with said blade and further constructed and arranged to bear against a clamped blade upon pressure being exerted on said fluid whereby said pressure uniformly deforms said gasket against said blade thereby uniformly deforming said blade into said recess channel and uniformly tensioning said blade, said improvement comprising said gasket including an outer sleeve and an inner filler ring located within said outer sleeve, said outer sleeve and said inner filler ring including means being constructed and arranged to permit relative movement between said outer sleeve and said inner filler ring.

4,014,312

OVEN DOOR WINDOWS

Harold E. McKelvey, and Leonard B. Maciejewski, both of Plymouth, Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

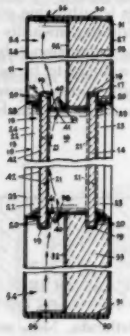
Filed Dec. 1, 1975, Ser. No. 636,635

Int. Cl.² F24C *15/04*

U.S. Cl. 126—198 **10 Claims**

1. A window unit for oven doors, comprising at least two spaced parallel glass panels, a frame surrounding the peripheral edges of said glass panels for maintaining them spaced from one another, said frame comprising two spaced channels for receiving the peripheral edges of the glass panels and a spacer portion between and integral with said channels, and

louvers provided in the spacer portions at the top and bottom of said frame and extending substantially the entire width of



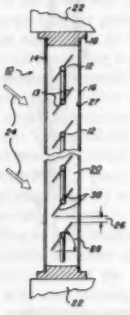
said glass panels and being provided with passages for the circulation of air through the space between the glass panels.

4,014,313

APPARATUS AND METHOD FOR COLLECTING SOLAR ENERGY AT AN UPRIGHT SURFACE

David William Pedersen, P.O. Box 1241, Telluride, Colo. 81435

Filed June 9, 1975, Ser. No. 585,100
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **13 Claims**



1. A solar energy collector adaptable for use at an exterior generally upright surface of a building comprising:

a compartment having spaced apart exterior and interior covers of essentially transparent characteristics, and means for retaining the compartment at an exterior generally upright surface of a building;

at least one energy receiving element comprising at least one solar radiant energy receiving and absorbing surface generally oriented at an angle to the plane of the generally upright building surface for efficiently receiving solar radiant energy according to the position of retention of said compartment at the exterior surface of the building, each energy receiving element also comprising a conduit means connected in heat conductive relationship with each solar energy receiving and absorbing surface, each energy receiving element being retained within said compartment between the interior and exterior cover members with a space on each side of each energy receiving element, the space on each side of each energy receiving element in conjunction with the angular orientation of the solar radiant energy receiving and absorbing surface providing a substantial sight path directly and angularly through said compartment; and

means connecting the conduit means for passing a fluid medium through the conduit means and for transporting energy away from each energy receiving element and out of said compartment.

11. A method for collecting solar radiant energy at an exterior generally upright surface of a building, comprising the steps of:

providing a plurality of solar radiant energy receiving elements at a transparent exterior generally upright surface of a building, each element having an energy receiving surface and a conduit in heat conductive relationship with the energy receiving surface;

orienting each energy receiving surface generally at an angle to the exterior generally upright surface of the building for effectively receiving radiant energy;

separating each solar radiant energy receiving element by a space on each side of each energy receiving element to allow a sight path directly and angularly through the transparent exterior surface of the building between adjacent energy receiving elements;

passing a fluid medium through each conduit in each energy receiving element; and

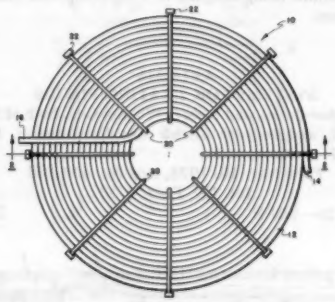
transporting energy from each energy receiving element and to a remote area of the building for use.

4,014,314

SOLAR ENERGY COLLECTOR PANEL

T. Lawrence Newton, Atherton, Calif., assignor to Sunburst Solar Energy, Inc., Menlo Park, Calif.

Filed May 8, 1975, Ser. No. 575,978
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **6 Claims**



1. A solar heating panel for fluid heat transfer media, comprising:

an elongated, tubular flow channel of flexible, cylindrical tubing for said media, wound into a planar, continuous spiral substantially toroidal in outline and having an outer and inner diameter;

a plurality of radially disposed, angularly spaced apart, elongated clamps, restraining said flow channel in said planar configuration, each said clamp being U-shaped and having parallel arms and a connection between said arms, the internal spacing between said arms corresponding to the outer diameter of said channel, the connection of each said clamp engaging said channel at the inner diameter of said spiral, one said arm extending over the top of said spiral and the other said arm extending below said spiral; and

inlet and outlet connections, communicating with either end of said channel, at the inner and outer peripheries thereof, respectively, for the admission and discharge of fluid heat transfer medium;

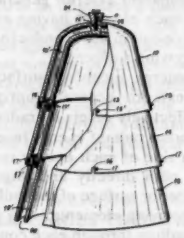
said panel having no enclosure for said channel other than said clamps.

4,014,315

COVER FOR COOKING KETTLES

Carlos Lagunilla, Francisco del Paso y Troncoso No. 324B6 Unidad Kennedy, Mexico 9, D. F., Mexico

Filed Nov. 3, 1975, Ser. No. 628,254
Claims priority, application Mexico, Nov. 18, 1974, 155020
Int. Cl.² F24C *1/16*
U.S. Cl. 126—275 R **3 Claims**



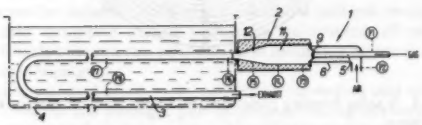
1. A double-walled telescopeable and demountable cover for cooking ovens having inner and outer walls parallely spaced forming a thermal insulating chamber therebetween, each of said walls being formed by a plurality of partially overlapping frustoconical elements, said overlapping elements having the outside diameter of the uppermost portion of one element slightly less than the inside diameter of the lowermost portion of the adjacent overlaying element, said adjacent frustoconical elements being overlapped at their ends and engaged by a bayonet coupling, said walls having a bell-shaped uppermost section with an external central protrusion having a central threaded bore, said protrusion on each of said bell-shaped sections being coupled in a superimposed manner by fixing means.

4,014,316

SYSTEMS FOR HEATING FLUIDS

Derek Arthur Jones, and Robert William Cox, both of Solihull, England, assignors to British Gas Corporation, London, England

Filed Nov. 10, 1975, Ser. No. 630,505
Int. Cl.² F24H *1/28*
U.S. Cl. 126—360 R **2 Claims**



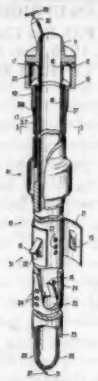
1. Gas-fired apparatus for the direct firing of an immersion tube for heating liquid in a vat or tank, including in combination, a burner of the nozzle-mixing type having a burner head comprising a gas supply tube closed at its inner end, the closed end of the gas tube being provided with equally spaced gas outlet ports inclined at an angle of between 40° and 50° to the tube axis, an air tube of greater diameter than the gas tube and disposed concentrically about it, and an annular perforate member of conical form substanting an angle of revolution of between 40° and 50° and fixed to said gas tube behind said gas outlet ports with its outer peripheral edge spaced slightly forwardly from the inner cylindrical surface of said air tube so as to project into said combustion chamber, disposed substantially across the annular space defined between the outlet ends of the gas and air tubes with its inner peripheral edge located behind the gas outlet ports, means for supplying air and gas separately to the burner head above atmospheric pressure, means for igniting a combustible gas/air mixture adjacent said burner head, a combustion chamber disposed downstream of the burner external to the vat or tank, the combustion chamber consisting of a hollow cylindrical cavity formed in a block of refractory material, the diameter of the cavity over the greater proportion of its length being greater than the diameter of the air tube and tapering inwardly towards its end which communicates with the immersion tube, and an immersion tube for immersion in a liquid to be heated, said immersion tube being of small bore and of predetermined length and communicating the combustion chamber and an outlet for exhaust gases.

4,014,317

MULTIPURPOSE CARDIOCIRCULATORY ASSIST CANNULA AND METHODS OF USE THEREOF

Anthony M. Bruno, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 18, 1972, Ser. No. 227,399
Int. Cl.² A61M *25/00*; A61B *19/00*
U.S. Cl. 128—1 D **18 Claims**



1. A multipurpose cardiocirculatory assist device comprising:

a hollow elongated cannula having a diameter sufficiently small for insertion into a human artery leading to the aorta, said cannula having a leading tip at the upstream end and a trailing end at the downstream end thereof, wherein upstream and downstream relate to the direction of blood flow during arterial usage;

electrode means at the leading tip of said cannula for pacing the heart;

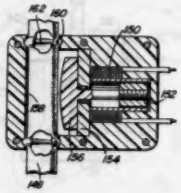
blood pump means to pump blood from the left ventricle during cardiac systole and into the aorta during cardiac diastole, including inlet valve means along said cannula and adapted to be disposed within the left ventricle during usage for allowing blood to pass into said blood pump means, and outlet valve means along said cannula downstream from said inlet valve means and adapted to be disposed within the aorta during usage for allowing blood to pass out of said blood pump means; and

supplementary heart pumping assist means comprising balloon pump means including a balloon connected to said cannula disposed downstream from said outlet valve means, said balloon pump means causing inflation of said balloon during cardiac diastole and deflation of said balloon during cardiac systole.

4,014,318
CIRCULATORY ASSIST DEVICE AND SYSTEM

James M. Dockum, 206 E. Marion St., Monroe, Iowa 50170, and Norman H. Nitzkowski, La Salle Building, Mankato, Minn. 56001

Continuation-in-part of Ser. No. 389,438, Aug. 20, 1973, abandoned. This application May 22, 1975, Ser. No. 579,892
Int. Cl.² A61M *1/03*; A61F *1/24*
U.S. Cl. 128—1 D 8 Claims



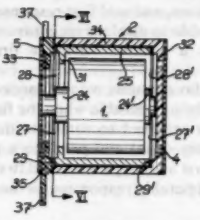
1. A miniaturized heart substitute implantable into the body of a living animal comprising a first tubular prosthesis adapted to be incorporated into the pulmonary artery with an inlet end thereof adapted to be communicated with the superior vena cava and the inferior vena cava, a second tubular prosthesis adapted to be incorporated into the aorta with an inlet end adapted to be communicated with the pulmonary vein, said prostheses being arranged in parallel, side-by-side relation, each tubular prosthesis being flexible and resilient and including a pair of longitudinally spaced valve means for one way flow therethrough, and a circulatory assist device associated with said tubular prostheses for sequentially and cyclically collaspsing portions of each tubular prosthesis from an inlet end toward the discharge end for pumping blood through the prostheses in a manner equivalent to the pumping action of a natural heart, said device including a pair of parallel, spaced, elongated stationary abutments receiving the tubular prostheses therebetween, movable members positioned between the tubular prostheses in opposed relation to the stationary abutments, and independent magnetically actuated means independently moving said movable members sequentially toward and away from the abutments for pumping blood through each tubular prosthesis, said magnetically actuated means including a solenoid for each movable member, each solenoid including a housing, a coil winding in said housing, a magnetic member connected to the movable member and associated with the coil winding for reciprocation of the movable member, said abutments being rigid with said housing and interconnected by an extension integral with the housing and disposed at one edge of the abutments, the opposite edges of the abutments being free, each movable member having an extension thereon parallel to the extension on the housing and extending over the free edge of the abutment adjacent the magnetic member and connected to the magnetic member, said magnetic members being generally in alignment with the longitudinal center of the tubular prosthesis, said valve means including a valve ring and disc flap assembly disposed interiorly of the prosthesis, said housing including annular recess means receiving said valve ring, said valve ring having a diameter greater than the prosthesis for anchoring the valve means and prosthesis in said recess means.

4,014,319
INTERCRANIAL PRESSURE TRANSDUCER

Robert Favre, Lausanne, Switzerland, assignor to Etat de Vaud, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,030
Claims priority, application Switzerland, Mar. 7, 1974, 3250/74
Int. Cl.² A61B *5/00*
U.S. Cl. 128—2 R 10 Claims

1. An intercranial pressure transducer of the passive type, including: a sealed capsule adapted to be housed in the thickness of a skull; a movable permanent magnet within said capsule; guide means for guiding displacement of said magnet axially within said capsule; and said capsule including means for subjecting said magnet to a hydrostatic force generated by

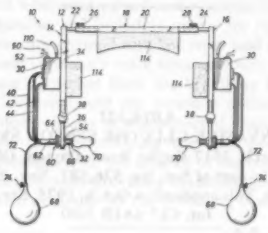


the intercranial pressure within said skull, whereby said magnet is displaceable by an external magnetic field applied thereto and which is sufficiently strong to overcome said hydrostatic force applied to said magnet and whereby the strength of the external magnetic field required to displace said magnet is a measure of said intercranial pressure.

4,014,320
AUDIOMETRIC APPARATUS

George Benton Richards, 804 Harmon, Longview, Tex. 75601

Filed May 14, 1975, Ser. No. 577,451
Int. Cl.² A61B *5/12*
U.S. Cl. 128—2 Z 2 Claims



1. Apparatus for sequenced contralateral testing of intraaural muscle reflex, said apparatus comprising:

first probe means sealingly positionable in a first auditory canal of a patient for isolating a first volume therein;

first inflatable bladder means carried by said first probe means for circumferentially expanding when pressurized fluid is introduced into said first bladder means;

said first probe means being operable to carry:

first pressure control means for controlling a pressure in the first volume;

first audio stimulus generating means for selectively producing an audio stimulus in the first auditory canal;

first response detecting means for detecting in the first auditory canal a response to the stimulus of said first audio stimulus generating means;

second probe means operably connectable to said first probe means, said second probe means being positionable in a second auditory canal of a patient for isolating a second volume therein;

second inflatable bladder means carried by said second probe means for circumferentially expanding when pressurized fluid is introduced into said second bladder means;

said second probe means being operable to carry:

second pressure control means for controlling a pressure in the second volume;

second audio stimulus generating means for selectively producing an audio stimulus in the second auditory canal;

second response detecting means for detecting in the second auditory canal a response to the stimulus of said second audio stimulus generating means;

said first pressure control means, said first audio stimulus generating means, and said first response detecting means being cooperable to displace an eardrum in the first auditory canal to a position having a first predetermined compliance;

said second audio stimulus means carried by said second probe means being operable when the first predetermined compliance is achieved to stimulate the eardrum in the second auditory canal and produce a reflex in the eardrum in the first auditory canal, said first pressure control means being operably responsive to the reflex of the first eardrum;

said second pressure control means, said second audio stimulus generating means, and said second response detecting means being cooperable to displace an eardrum in the second auditory canal to a position having a second predetermined compliance;

said first audio stimulus means carried by said first probe means being operable when the second predetermined compliance is achieved to simulate the eardrum in the first auditory canal and produce a reflex in the eardrum in the second auditory canal, said second pressure control means being operably responsive to the reflex of the second eardrum.

4,014,321

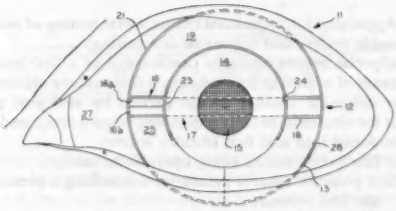
NON-INVASIVE GLUCOSE SENSOR SYSTEM

Wayne F. March, 2517 Rugby Road, Dayton, Ohio 45406

Continuation-in-part of Ser. No. 526,581, Nov. 25, 1974, Pat. No. 3,958,560. This application Oct. 6, 1975, Ser. No. 619,954

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 A **15 Claims**



1. A non-invasive glucose sensor system for determining the sugar content in a user's blood,

said system comprising radiation emitting means for emitting radiation of certain wavelengths,

radiation detecting means for detecting the emitted radiation,

said radiation detecting means spaced apart from but in line with said radiation emitting means,

means for mounting said radiation emitting means and radiation detecting means so that said radiation is capable of being transmitted through the cornea of the user's eye, and

enabling means for enabling said detecting means to determine the optical rotation of the radiation occurring in the cornea.

4,014,322

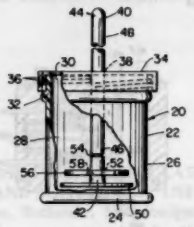
SPECIMEN COLLECTING DEVICE AND METHOD

Nayan S. Shah, Carpentersville, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 23, 1975, Ser. No. 625,294

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 F **36 Claims**



1. A device for collecting aseptic liquid specimens, comprising:

a container having wall means defining a chamber and an opening communicating with the chamber;

liquid sampling means comprising, compressible liquid absorption means for receiving the liquid specimen, and handle means for supporting the absorption means while receiving the specimen and placing the specimen containing absorption means in said chamber through the container opening; and

means for compressing the absorption means in the container chamber after receipt of the specimen to release the specimen into the chamber, said compressing means comprising spaced plate means being movable toward each other with the absorption means supported by the handle means between the plate means to squeeze the absorption means and release the specimen.

4,014,323

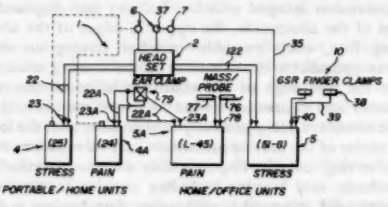
ELECTROTHERAPY SYSTEM

James Ray Gilmer, 510 Nesbitt Drive, Garland, Tex. 75041; Harry Alvin Bowers, 305 Edgefield, Garland, Tex. 75040, and Robert Earl Day, 1502 Hiawatha Drive, Garland, Tex. 75041

Filed June 30, 1975, Ser. No. 591,402

Int. Cl.² A61B *5/05;* **A61N** *1/36*

U.S. Cl. 128—2.1 Z **3 Claims**

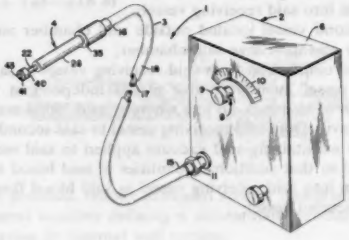


1. An electrotherapy system comprising: pulse train generating means for providing a series of bursts of low level electrical energy, including output terminal means; patient-engaging means, including input terminal means connectable in electrical circuit with said output terminal means and further including electrodes in circuit with said input terminal means for transmitting said bursts of electrical energy to a patient needing therapeutic treatment; control means for manually adjusting the relative level of electrical energy produced by said pulse train generating means; and passive, measuring means for indicating the patient's emotional stress state and changes therein, simultaneously with treatment using said bursts of energy, including galvanic skin electrical resistance sensing means.

4,014,324
ROTARY MASSAGING DEVICE AND METHOD OF USING SAME

Warren G. Cellers, 127 N. Summit, Arkansas City, Kans. 67005

Filed Apr. 26, 1976, Ser. No. 680,517
Int. Cl.² A61H 7/00
U.S. Cl. 128—46 8 Claims

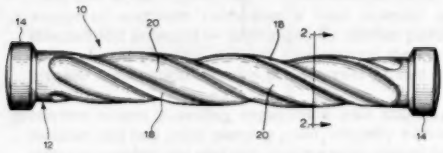


1. A rotary massaging device comprising:
a. power means for producing rotary motion;
b. a massaging element including an eccentrically attached knob adapted for orbitally kneading a patient;
c. a rotary power transmission means operably connecting said power means to said massaging element to rotate same; and
d. means for varying the speed of said power means rotary motion whereby an operator of said device sets said speed to correspond with the pulse rate of said patient.

4,014,325
UNIQUE MECHANICAL FOOT MASSAGER

Charles W. Clarke, 207 N. Main, Morton, Ill. 61550

Filed Dec. 22, 1975, Ser. No. 643,017
Int. Cl.² A61H 15/00
U.S. Cl. 128—57 2 Claims



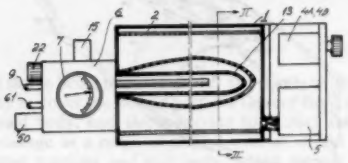
1. The massaging device of claim 5 wherein said cylindrical member has a diameter between about 0.75 and 2.00 inches and said spiral ridges are spaced between about 0.5 and 1.60 inches on the circumference of said member.

4,014,326
RESPIRATOR SYSTEM

Robert Müller, Taby, Sweden, assignor to Cameco AB, Enebyberg, Sweden

Filed Apr. 21, 1976, Ser. No. 678,861
Claims priority, application Sweden, Apr. 30, 1975, 7505099
Int. Cl.² A61M 16/00
U.S. Cl. 128—145.6 7 Claims

1. A respirator system comprising
a. a pressure chamber,
b. a breathing bladder,
c. a pulse transmitter,
d. a pressure pulse generator,
e. a valve block means,
f. a pilot valve,
g. an automatic valve means, and
h. an expiratory valve,
i. patient communication means,
wherein said breathing bladder contains breathing gas for substantially constant pressure and is disposed in said pressure chamber for being squeezed together and for expanding, respectively, as the result of the exterior of said breathing bladder intermittently being set under pressure of atmospheric air and being relieved, respectively, said pressure pulse generator being connected to said pressure chamber and being responsive to said pulse transmitter,
said valve block means being connected to said breathing bladder for supplying breathing gas to the interior of said bladder from a source of breathing gas and for discharging said gas from the interior of said bladder to said pilot valve, said patient communcation means being connected to said pilot valve,
said valve block means being detachably connected to the



pressure chamber and including said automative valve means for connecting the pressure chamber to said pilot valve,
said pilot valve including said expiratory valve communication with said patient communication means, and
said automative valve means including spring-loaded pin means adapted for being depressed by said pressure chamber when said valve block is connected to said pressure chamber and including means for retaining open a pilot pressure channel supplied from said pressure chamber to said expiratory valve simultaneously with breathing gas being conveyed from the breathing bladder to one patient, whereas said pin means is extended when said valve block means is disconnected from said pressure chamber, thereby retaining the pilot pressure channel under pressure from the interior of the breathing bladder for simultaneously providing breathing gas to the patient by manual actuation of the breathing bladder.

4,014,327
TENNIS ELBOW SPLINT

Irving Spiro, 7925 West Drive, North Bay Village, Fla. 33141

Filed Apr. 16, 1976, Ser. No. 677,831
Int. Cl.² A61F 13/00
U.S. Cl. 128—165 1 Claim

1. A splint for the prevention of tennis elbow and for the relief from its pain comprising a pair of pliable bands adapted to be positioned about the wrist and forearm of a person, a loop secured at one end of each of said bands, a strap secured to the other end of each of said bands, said straps having interengaging fastening surfaces whereby upon said straps extending through said loops and being folded upon them-

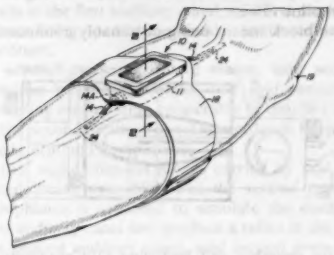
selves for interengagement, said pliable bands are held firmly in position about said wrist and forearm, an elongated and pliable member forming a pocket extending between said bands and an elongated and substantially slightly resilient member received in said pocket extending along and pressing against said forearm.

4,014,328

BLOOD SAMPLING AND INFUSION CHAMBER

Kenneth C. Cluff, 443 N. 600 East, Oren, Utah 84057, and Larry L. Bruce, 4029 S. 45th Place, Phoenix, Ariz. 85040

Filed June 23, 1975, Ser. No. 589,018
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **9 Claims**



1. Apparatus for blood sampling and infusion comprising:

a chamber formed from a fluid impervious material having an opening surrounded with an outwardly flared edge, an entry port and an exit port,

said ports each being contoured for connection to a cannula for insertion into a patient's bloodstream to permit the flow of blood through said chamber,

a resilient plug means for snugly fitting into said opening and extending part way into said chamber to define a given cavity in said chamber,

said plug means being provided with a flange extending laterally of its length for seating on said edge of the opening of said chamber,

said resilient plug means being formed of a nontoxic sterilizable material pierceable by a needle and self-sealing upon withdrawal of the needle to afford removable communication with said cavity by means of a hollow needle supplying or withdrawing fluids between said cavity and a patient,

a cover for said opening of said chamber,

said cover extending over the part of said plug means extending outwardly of said opening and overlapping the edges of said plug means seated on said flared edges of said opening in said chamber and fastened to the outside of said chamber,

and clamping means for engaging the outside of the chamber for fastening the apparatus to the patient,

the outer periphery of said chamber being provided with a groove within which said clamping means extends in a snug fitting arrangement for firmly holding said chamber to a patient.

4,014,329

METHOD AND APPARATUS FOR AUTOTRANSFUSION OF BLOOD

Joseph D. Welch, Galveston, Tex.; Barbara J. Doyle, Rochester (now by change of name Barbara J. Gutterman); Harvey A. Weintraub, Rochester, both of N.Y., and Ludovico Cerulli, Lucca, Italy, assignors to The Rochester General Hospital, Rochester, N.Y.

Filed July 3, 1975, Ser. No. 593,163
Int. Cl.[2] A61M *5/14, 1/02*
U.S. Cl. 128—214 R **10 Claims**

1. A device for infusing blood from a patient wherein the blood may be continuously retrieved from and infused into the patient, comprising:

a. a vacuum chamber including means for applying a vacuum thereto;

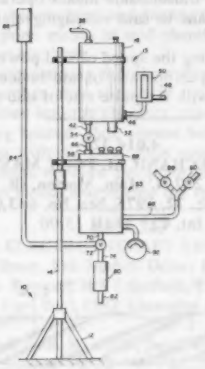
b. a separate receiving vessel located within said chamber;

c. throttling means associated with said vacuum means for applying a differential vacuum to said chamber and said receiving vessel whereby the vacuum applied to said chamber is greater than the vacuum applied to said receiving vessel;

d. a pick-up line connected to said receiving vessel and of sufficient length to extend to the source of blood to be drawn into said receiving vessel;

e. a second vessel located outside said chamber and at a lower elevation than said chamber;

f. a fluid connection from said receiving vessel to said second vessel including valve means independent of the action of said pick-up line whereby said blood may flow by gravity from said receiving vessel to said second vessel while maintaining said vacuum applied to said receiving vessel so that additional quantities of said blood may be drawn into said receiving vessel as said blood flows into said second vessel;



g. means engaging said second vessel for expelling said blood from said second vessel for delivery to said patient; and

h. filter means in said device for cleaning the blood and removing impurities.

10. The method of infusing blood from a patient comprising the steps of:

a. retrieving the blood continuously from the patient by suction into a receiving vessel located within a vacuum chamber;

b. providing a differential vacuum between said receiving vessel and said vacuum chamber such that said vacuum chamber is under a greater vacuum than said receiving vessel;

c. transferring said blood from said receiving vessel to a second vessel outside of said vacuum chamber without interrupting the flow of said blood to said vacuum chamber;

d. transferring said blood from said second vessel to said patient; and

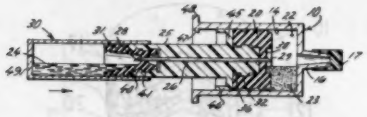
e. filtering said blood before returning said blood to said patient for cleaning said blood and removing impurities.

4,014,330

DISPOSABLE TWO-COMPARTMENT SYRINGE

Joseph Nicholas Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1975, Ser. No. 626,020
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 M **10 Claims**



1. A prefilled, readily activated syringe comprising:

a barrel member defining a substantially tubular chamber having an internal wall section;

means defining a nozzle member communicating with said tubular chamber for attachment with a cover in one instance, and a hypodermic needle in another instance;

a puncturable sealing element in sealing engagement with the internal wall section of said barrel member and spaced from said nozzle member to provide a compartment for a medicinal material;

a slidable piercing member disposed in said syringe barrel and spaced from said puncturable sealing element, said piercing member comprising:

a piercing tubular member having oppositely disposed piercing points;

force fitment means carried by said piercing member and said puncturable sealing element to position one of said piercing points in nonpiercing contact with said sealing element and upon slidable movement of said slidable piercing member toward said puncturable sealing element, to lock said piercing member in pierceable engagement and in communication with said compartment;

a stoppered container containing a fluid material constructed and arranged to be engaged by another piercing point of said piercing member and pierced thereby to provide communication with the contents of said container;

protective covers in sealing engagement with said nozzle member and said other piercing point, whereby with said piercing member and said one piercing point spaced from said puncturable sealing element, movement of said slidable piercing member toward said sealing element will effect a first piercing of said puncturable sealing element and locking engagement with said sealing element as well as communication with said compartment and with positioning of said stoppered container in a second independent piercing engagement with said other piercing point of said piercing member, fluid communication between said stoppered container and said compartment is established with movement of said container toward said piercing member effecting a flow of said fluid material into said compartment with a resulting mixing thereof and further movement of said vial toward said puncturable sealing element will effect an expelling of said mixture from said nozzle member.

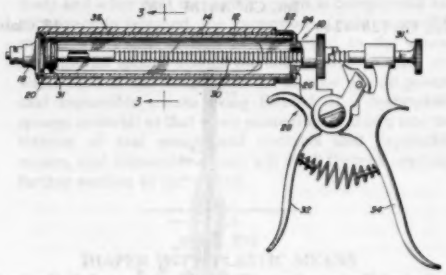
4,014,331

SYRINGE BARREL WITH PROTECTIVE PLASTIC COVER

James E. Head, R.R. 5, Hereford, Tex. 79045

Filed Dec. 30, 1975, Ser. No. 645,479
Int. Cl.² A61M 3/00
U.S. Cl. 128—224 **6 Claims**

1. In combination with a syringe assembly of the type including a frangible open ended tubular barrel snugly received within a longitudinally slotted tubular body including at least partial end walls between which said barrel is received, a thick walled cylindrical sleeve constructed of plastic material expandable upon heating and shrinkable upon subsequent cooling, said sleeve being telescoped over and tightly shrunk about said body to cover the slotted portions thereof from the exterior of said body, said sleeve serving to protect said barrel from breakage as a result of impact with an object through said slotted portions and said body against impact with an object.

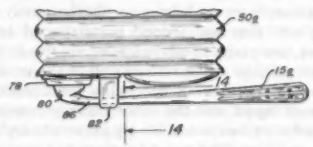


4,014,332

DISPOSABLE SYRINGES

Vincent R. Sneider, 3422 Hillcrest Drive, Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 389,506, Aug. 20, 1973, abandoned. This application June 30, 1975, Ser. No. 592,037
Int. Cl.² A61M 3/00
U.S. Cl. 128—227 **7 Claims**

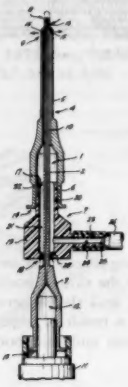


1. A syringe for vaginal douche and enemas and the like, said syringe including: (a) a flexible container having an accordion configuration; (b) a discharge conduit adapted for fluid-tight connection to the container; (c) a manipulative shutoff valve associated with said discharge conduit, said valve when open permitting the flow of fluid from the container, said conduit being semiflexible and having a substantially circular cross section, the conduit having at least one stiffening rib locally formed as a part of the outer surface of the conduit and providing an assist to insure bending of the conduit into a pinch configuration to provide fluid-flow cutoff when the conduit is bent substantially at a right angle to and away from the stiffening rib whereby in this bent condition the sides of the conduit are brought together to inhibit flow therethrough; (d) means for releasably retaining this conduit in the bent condition during storage and shipment until the conduit is straightened for fluid flow and use, and (e) a discharge nozzle attachably associated with the outlet end of the conduit.

4,014,333
INSTRUMENT FOR ASPIRATING AND IRRIGATING DURING OPHTHALMIC SURGERY

David J. McIntyre, 20245 Redmond-Fall-City Road, Redmond, Wash. 98052

Filed Sept. 22, 1975, Ser. No. 615,216
Int. Cl.² A61M 3/00
U.S. Cl. 128—240 15 Claims



1. An instrument for effecting aspiration and irrigation during ophthalmic surgery comprising:

an elongated inner cannula telescopically disposed within a shorter outer cannula, the cannulae being rigid and substantially coaxial and defining a first passage therebetween, each cannula having an insertable end adjacent to the insertable end of the other, the first passage extending from the insertable end of the outer cannula to the remote end of the outer cannula remote from its insertable end, the inner cannula defining a second passage extending from its insertable end to the remote end of the inner cannula remote from its insertable end, the insertable end of the outer cannula having an exterior orifice communicating with the first passage, the insertable end of the inner cannula having an exterior orifice communicating with the second passage; and connector means interconnecting and forming a fluid-tight seal with each of the cannulae at locations remote from their insertable ends, the connector means having an interior cavity communicating with first and second ports spaced apart on its exterior, the cavity communicating via the first port with the first passage at the remote end of the outer cannula, the second port being accessible for connection to a source of liquid, and the inner cannula passing through the connector means and having its remote end accessible for connection of the second passage to a vacuum source.

4,014,334
LAMINATED OSMOTIC SYSTEM FOR DISPENSING BENEFICIAL AGENT

Felix Theeuwes, Los Altos, and Atul D. Ayer, Belmont, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

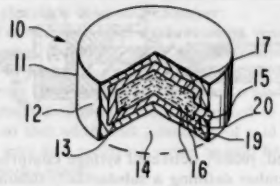
Filed Feb. 2, 1976, Ser. No. 654,194
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.
Int. Cl.² A61M 31/00
U.S. Cl. 128—260 36 Claims

1. An osmotic system for the controlled and continuous dispensing of a beneficial agent to an environment of use, said system comprising:

a. a shaped wall comprising a laminate, said laminate comprising a semipermeable lamina that is permeable to the passage of an external fluid and which lamina substantially maintains its physical and chemical integrity in the environment of use; and a semipermeable lamina that is permeable to the passage of an external fluid, substantially impermeable to the passage of agent and which lamina substantially maintains its physical and chemical integrity in the presence of fluid and agent, said wall surrounding;

b. a compartment containing the beneficial agent;

c. a passageway in the wall communicating with the compartment and the exterior of the system for dispensing agent from the system; and

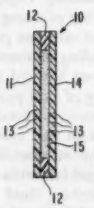


d. wherein in operation when the system is in the environment of use, fluid from the environment is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving agent that is dispensed through the passageway at a controlled and continuous rate over a prolonged period of time.

4,014,335
OCULAR DRUG DELIVERY DEVICE

Randall K. Arnold, San Jose, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 569,953, April 21, 1975, Pat. No. 3,961,628, which is a continuation-in-part of Ser. No. 493,819, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 227,051, Feb. 17, 1972, abandoned. This application Mar. 25, 1976, Ser. No. 670,267
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.² A61M 31/00
U.S. Cl. 128—260 27 Claims



1. An ocular device for the administration of drug comprising a three layered laminate having a pair of separate and discrete first and third walls formed of a material insoluble in tear fluid with one of the walls formed of a drug release rate controlling material permeable to the passage of drug and the other wall formed of a material impermeable to the passage of drug, a second wall interposed between the first and third walls and formed with an inwardly disposed hole with the second wall sealingly engaging the first and third walls to form a reservoir containing a drug selected from the group consisting of antibiotic, antibacterial, antiviral, antiallergenic, anti-inflammatory, miotic, anticholinesterase, mydriatic and sympathomimetic drugs, and wherein drug is administered from the device at a controlled and continuous rate by passage through the rate controlling wall over a prolonged period of time.

4,014,336
INHALATION DEVICE

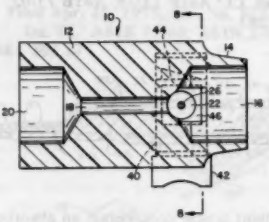
Stanley Mathes, Mountain View, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Continuation-in-part of Ser. No. 540,917, Jan. 13, 1975, Pat. No. 3,938,516. This application Nov. 20, 1975, Ser. No. 633,780

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² A61M *13/00, 15/06*

U.S. Cl. 128—266 **28 Claims**



1. An inhalation device comprising an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof, said passageway terminating in an emptying chamber adjacent the output end of said housing, the cross-sectional area of said passageway being less than the cross-sectional area of said emptying chamber; means for receiving a closed medicament-holding container; means to open the medicament-holding container as the container is inserted into said container receiving means; and hollow means for directing a stream of air drawn therethrough during inhalation into an opened medicament-holding container positioned within said container receiving means, whereby air drawn through said passageway and through said hollow means cooperate to cause the medicament in the medicament-holding container to be dispensed therefrom.

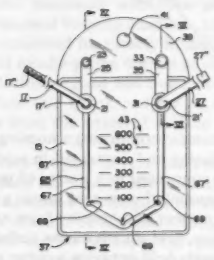
4,014,337
EVACUATOR DEVICE

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Mar. 26, 1976, Ser. No. 671,005

Int. Cl.² A61M *1/00*

U.S. Cl. 128—278 **11 Claims**



1. A closed wound evacuation device for drawing waste fluid from a closed wound in a patient's body, said evacuation device comprising:

a. a substantially collapsible pouch formed of an air- and liquid-impermeable material having a first opening therethrough for allowing a first end of a first hollow tube to be selectively attached thereto adjacent said first opening therethrough and in operative cmmunication with the interior of said pouch; and

b. expansible means enclosed within said pouch so that when the first end of the first hollow tube is attached to said pouch and when the second end of the first hollow tube is positioned within a closed wound in a patient's body and when said expansible means is compressed and subsequently released, the expansion of said expansible means will cause suction to be applied to the wound through the second end of the hollow tube to draw any waste fluid in the wound into the interior of said pouch, said expansible means being formed of a hydrophilic sponge material so that when waste fluid is drawn into the interior of said pouch and contacts said expansible means, said expansible means will swell thereby applying further suction to the wound.

4,014,338
DIAPER WITH ELASTIC MEANS

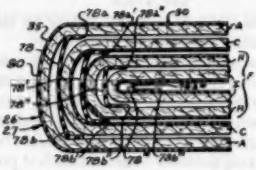
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 519,493, Oct. 31, 1974, Pat. No. 3,951,150. This application Jan. 14, 1976, Ser. No. 648,981

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **8 Claims**



1. A disposable diaper, comprising: an absorbent pad assembly having an absorbent pad, a pair of waistline portions, a crotch portion intermediate said waistline portions, a front surface, a back surface, a pair of side edges, a pair of end edges connecting said side edges, a plurality of longitudinally extending folds defining an inverted pleat configuration of the pad assembly, said pad assembly having a first pair of fold lines defining a longitudinally extending central panel, a second pair of fold lines defining a pair of intermediate back panels underlying the back surface of the central panel and a pair of side panels extending from said second fold lines around said first fold lines, and side panels having a pair of outer back panels underlying said intermediate back panels and a pair of outermost panels overlying the front surface of said central panel, said pad assembly having a fold in said crotch region along a lateral fold line and defining end sections of the pad assembly with the back surfaces of the outer back panel end sections facing each other, and said pad assembly having an elastic band extending across said lateral fold line and having opposed ends secured on opposite sides of the lateral fold line to the back surface of the outer back panel.

4,014,339
DIAPER WITH COLLAPSIBLE ADHESIVE TAB FASTENER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 12, 1976, Ser. No. 666,274

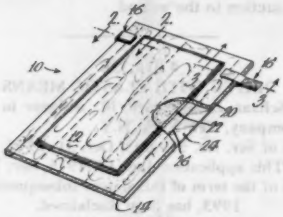
Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **10 Claims**

1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet subbstantially coextensive with

said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

an integral tape ribbon folded to form a plurality of articulated segments including a backing-anchoring segment which is secured to said backing sheet, a release-bearing segment connected at one end to an adjacent end of said backing-anchoring segment and having an opposite end, a securing segment connected at one end to said opposite end of said release-bearing segment and having an opposite end, and a facing-anchoring segment connected at one end to said opposite end of said securing segment and



having an opposite distal end which is secured to said facing sheet, each segment having an inner face and an outer face;

a first pressure-sensitive adhesive means on the outer face of said securing segment; and

release means on the outer face of said release-bearing segment contiguous to and protecting said first pressure-sensitive adhesive means when the tab fastener is in a storage position, said first pressure-sensitive adhesive means being removable from said release means to assume a working position wherein said first pressure-sensitive adhesive means is available for securing the diaper about an infant.

4,014,340

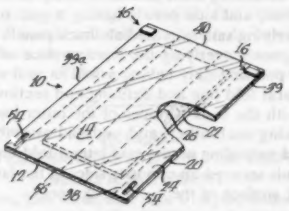
TAPE CLOSURE HAVING A SLOT FOR RECEIVING A DIAPER CORNER THERETHROUGH

Ernest Cheslow, Glencoe, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 12, 1976, Ser. No. 666,275

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **7 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means comprising an integral elongated tape segment having a fixed end permanently attached to a first corner of said diaper along a side margin and one transverse margin of said diaper, and a free working end having a pressure-sensitive adhesive coating on one face thereof, said diaper having an opening at a second corner of said diaper along said side margin and an opposite transverse margin of said diaper, whereby said first corner and said free working end can be inserted through said opening and said free working end can be adhered to said backing sheet to secure said diaper about an infant.

4,014,341

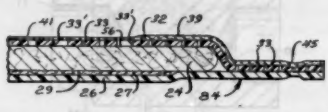
ABSORBENT ARTICLE AND METHOD

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 552,463, Feb. 24, 1975, Pat. No. 3,994,299. This application Aug. 2, 1976, Ser. No. 710,966

Int. Cl.² A61F *13/18*; A41B *13/02*

U.S. Cl. 128—287 **2 Claims**



1. An absorbent article comprising, an absorbent pad having a front surface, a fluid pervious top sheet covering at least a portion of the front surface of the pad, and a film of thermoplastic material intermediate the top sheet and pad, said film being fused to said top sheet in a region of said film over said pad, said film having a plurality of openings extending through the film in at least a portion of said region to define a fluid receiving area of the article.

4,014,342

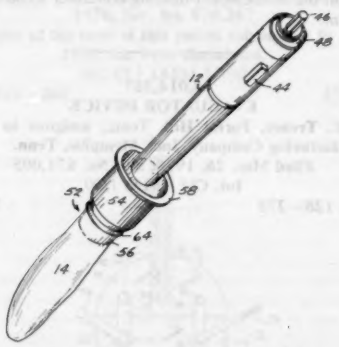
VITREOUS CUTTER

David Edward Staub, Clearwater; Carl Leroy Foltz, Holiday, and Raymond Walter Simmons, Pinellas Park, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Filed Apr. 11, 1975, Ser. No. 567,087

Int. Cl.² A61B *17/32*

U.S. Cl. 128—305.1 **18 Claims**



1. A surgical instrument comprising a housing, motor means mounted in said housing and contained in said housing, said motor means being connected to a source of power, a removable sheath means mounted over said housing and surrounding said housing to protect said housing from external materials and contamination, said sheath means defining annular lip means which is securely held between a cutter means and said housing to prevent contamination materials from entering said sheath means, said cutter means removably mounted to said housing, said cutter means comprising a body, a tube projecting from said body, a blade means positioned in said tube and drive transfer means mounted in said cutter means body, said drive transfer means connecting said blade means to said motor means for movement of said blade means when said motor means is activated, said tube defining an aperture, said

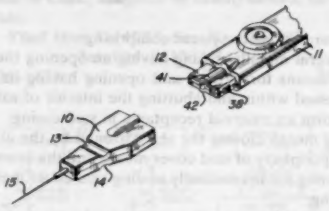
blade means in combination with the walls defining said aperture being adapted to shear tissue entering said hole and a passage means formed in said cutter body and communicating with said tube to allow pressure differentials to be exerted to said tube.

4,014,343

DETACHABLE CHUCK FOR ELECTRO-SURGICAL INSTRUMENT

Janet M. Esty, Boulder, Colo., assignor to Neomed Incorporated, Boulder, Colo.

Filed Apr. 25, 1975, Ser. No. 571,517
Int. Cl.² A61B *17/40*; A61N *3/06*
U.S. Cl. 128—303.14 **7 Claims**



1. A detachable chuck adapted for removable attachment to a substantially flat elongated electrically insulating handle, the handle having a main body with a probe of reduced width and thickness relative to the main body at one end thereof, an electro-surgical signal generator connected to the other end of the handle and a receiving electrical connector contained within the probe extending from the said one end of the handle with the probe being of the same substantially flat configuration as the main body of the handle, said chuck comprising:

a housing of electrically insulating material having external dimensions conforming to the external dimensions of the handle main body and having a chamber opening into one end with the internal dimensions of said chamber conforming to the external dimensions of the handle probe for frictional engagement therebetween,

an elongated electrical conductor having an electrosurgical electrode on one end and a shank on the other end, said conductor being permanently and sealably retained by said housing so that said shank extends at least partially into said housing chamber while said electro-surgical electrode extends externally from said housing on the end opposite said chamber, said shank being positioned within said chamber so as to be in alignment with the electrical connector within the handle probe for wiping engagement therewith whenever the handle probe is inserted into said housing chamber, said housing chamber being dimensioned for closely fitting non-rotatable insertion of said handle-probe therein so as to prevent rotation of said electro-surgical electrode during use and effectively isolate said shank and the receiving connector in the probe from the external surface of said handle and chuck.

4. In an electro-surgical device, the combination comprising: a substantially flat electrically insulating handle having a main body with a narrow rectangular crosssection and a probe extending from one end of said main body and terminating in an extreme end surface wherein the probe likewise has a rectangular cross-section of reduced width and thickness relative to the main body, a port in the extreme end surface of the probe at least one electrical connector positioned within the probe parallel to the longitudinal axis thereof and in alignment with said port in the extreme end surface of the probe, said connector adapted to be connected in electrical communication with an electro-surgical generator through the handle, the probe including alignment tabs extending outwardly from the external surfaces of the probe,

a housing composed of electrically insulating material having a cross-section at a first end thereof corresponding in external dimensions to the cross-section of the main body of the handle and having a chamber extending thereinto from said first end with internal dimensions corresponding to the external dimensions of the probe, said chamber receiving said probe and further having slots extending along the inner surfaces of said chamber receiving the tabs of said probe thereby effecting a releasable locking juncture, said housing having a conductor-receiving channel extending axially therethrough from said chamber to the opposite end of said housing, and

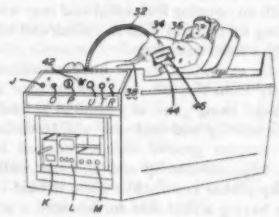
an electrical conductor having an electrosurgical electrode end and a shank end, said conductor being sealed within said housing channel so that said shank extends into said chamber and axially entering the port in said probe to effect positive electrical communication with the connector in said probe by the wiping action between the probe connector and said shank, said electro-surgical electrode end of said conductor protruding externally from said housing from said opposite of said channel, said housing chamber being dimensioned for close fitting non-rotatable insertion of the handle probe therein for forming a locking mechanical support for said housing between the inner wall surfaces of said chamber and the external wall surfaces of said probe to isolate said handle port from the external environment.

4,014,344

DECOMPRESSION BEDS FOR CHILDBIRTH AND METHOD FOR USING THEM

Moises Hernandez Gutierrez, Avenida de las Americas 932, Guadalajara, Jalisco, Mexico

Continuation-in-part of Ser. No. 404,910, Jan. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 322,720, Oct. 10, 1973, abandoned. This application Dec. 16, 1975, Ser. No. 641,357
Int. Cl.² A61B *17/42*; A61G *07/06*
U.S. Cl. 128—361 **8 Claims**



1. An obstetric apparatus including an elongated bed for use by an expectant mother, the bed comprising: a frame element; a bed surface movably mounted on said frame element and comprising a head section and a foot section; first power means for pivotally raising and lowering said head section about a first axis transverse to the major length axis of the bed; second power means for pivotally raising and lowering said foot section about a second axis parallel to but spaced from said first axis; third power means for pivotally moving said frame element, with said head and foot sections, about a central third axis parallel to the major length axis of the bed for producing up to an approximately 15° right side inclination and up to an approximately 15° left side inclination; and vacuum means integral with and mounted on said bed, for developing a vacuum about the lower body of the expectant mother after said frame element has been pivotally moved about said third axis to maximize the safety of the fetus and the comfort of the mother, said vacuum means including means for developing a vacuum in said vacuum-tight chamber according to a predetermined rhythm coinciding with the

rhythm of uterine muscular contractions experienced by the expectant mother for decompressing the expectant mother.

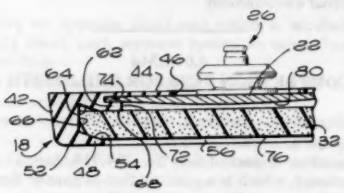
8. A method for relieving an expectant mother during the early stages of childbirth, the method comprising the steps of: having the expectant mother recline on the surface of an elongated bed; tilting the surface of said bed about a central axis parallel to the major length axis of the bed up to approximately 15° left or right side inclination for maximizing the safety of the fetus and the comfort of the expectant mother; encasing the lower portion of the expectant mother's body with a vacuum-tight chamber; and developing a rhythmic vacuum in said vacuum chamber according to the rhythm of muscular contractions of the uterus.

4,014,345

ELECTRODE

Stanley L. Kameny, 14314 Hatteras St., Van Nuys, Calif. 91401

Filed Oct. 28, 1975, Ser. No. 625,935
Int. Cl.² A61N *1/04*
U.S. Cl. 128—417 **1 Claim**



1. An electrode comprising:

a retaining ring formed of insulating material and having a side wall and a rear wall integral with one end of said side wall with an opening formed in said rear wall, an inwardly extending lip integral with the other end of said side wall defining a front opening;

an inwardly extending flange integral with and extending generally from the junction of said rear and side walls, said flange being generally parallel to and spaced intermediate said lip and said rear wall to define an enlarged height annular groove and a reduced height annular groove adjacent said lip and said rear wall, respectively;

a generally planar conductive plate in said reduced height groove having a first side surface and a second side surface and having dimensions for enabling said plate to be inserted in said reduced height groove and retained therein;

an electrical connector being secured to said conductive plate first side surface and extending into the retaining ring rear wall opening;

a sponge member having a front surface and a rear surface, said sponge member having a thickness approximately equal to the height of said enlarged height groove

wherein said sponge member is retained in said enlarged height groove, said sponge member when wet having said rear surface juxtaposed with said conductive plate second side surface and said front surface extending into said front opening; and

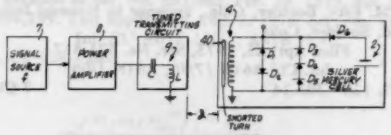
said enlarged height annular groove being formed of a pair of spaced apart surfaces on said lip and said flange, respectively, said spaced apart surfaces being formed in planes having an angle which intersects the plane of said planar conductive plate, said spaced apart surface planes being generally parallel to the plane of said sponge member front surface when said sponge member is immersed in a liquid.

4,014,346

HERMETICALLY SEALED CARDIAC PACER SYSTEM AND RECHARGING SYSTEM THEREFOR

Robert R. Brownlee, State College; G. Frank O. Tyers, Hershey, and Carl Volz, Sr., State College, all of Pa., assignors to Research Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,413
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PS **27 Claims**



1. A cardiac pacer system comprising:

an integral metallic casing having an opening therein;

cover means for closing said opening having its periphery recessed within and abutting the interior of said opening to form an external receptacle in said casing;

sealing means closing the seam formed by the abutment of the periphery of said cover means and the interior of said opening for hermetically sealing said cover means to said casing;

biocompatible means disposed in said receptacle for isolating said sealed seam from the exterior of said casing;

means in said casing for producing pacing pulses;

lead means connected to said pulse producing means and passing through said cover means for conducting said pacing pulses out of said casing;

rechargeable power cell means in said casing for powering said pulse producing means; and

means for recharging said power cell means comprising:

a first inductance in said casing disposed adjacent a metallic wall of said casing for receiving electromagnetic energy through said wall; and

tuned circuit means disposed outside of said casing for transmitting electromagnetic energy through said metallic wall to said first inductance, said tuned circuit means comprising a second inductance and a capacitance tuned such that said metallic wall acts as a shorted turn to absorb energy between said first inductance and said circuit means and modify the transmitted energy as a function of the distance between said wall and said second inductance.

16. An hermetically sealed cardiac pacer comprising:

an integral metallic casing having an opening therein;

cover means for closing said opening having its periphery recessed within and juxtaposed to the interior periphery of said opening to form an external receptacle in said casing;

sealing means closing the seam formed by the juxtaposed peripheries of said cover means and the interior of said opening for hermetically sealing said cover means to said casing;

biocompatible means disposed in said receptacle for isolating said seal seam from the exterior of said housing

means in said casing for producing pacing pulses;

means passing through said cover means for conducting said pacing pulses out of said casing;

rechargeable power cell means in said casing for powering said pulse producing means; and

means for recharging said power cell means comprising:

an induction coil in said casing disposed immediately adjacent a metallic wall of said casing;

a first diode connected in series with said induction coil and said power cell means;

second, third and fourth diodes connected in series with each other with like polarity and in parallel with said first diode and said power cell means; and

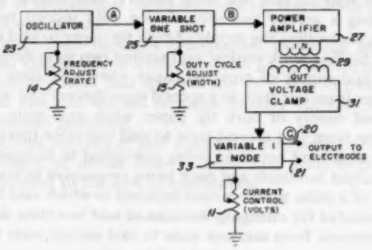
a fifth diode and a Zener diode connected with opposite

polarity in series with each other and in parallel with said induction coil, the polarity of said Zener diode being the same as that of said second, third and fourth diodes.

4,014,347
TRANSCUTANEOUS NERVE STIMULATOR DEVICE AND METHOD

Michael E. Halleck, Boulder, and Thomas H. Thomson, Longmont, both of Colo., assignors to Staodynamics, Inc., Longmont, Colo.

Filed May 27, 1975, Ser. No. 581,292
Int. Cl.² A61N 1/36
U.S. Cl. 128—422 **20 Claims**



1. A transcutaneous nerve stimulator for suppression of organic pain in a body, said stimulator comprising:

pulse generator means for producing a rectangular waveform at a predetermined frequency, said pulse generator means including means for adjustment of said produced rectangular waveform; and

output means connected with said pulse generator means to receive said rectangular waveform therefrom, said output means including a variable current-voltage mode circuit providing an AC output signal substantially without DC components and having a waveform with a fast rise and fall time no greater than about 12 microseconds with said waveform being sufficient to drive the impedance of a body positioned contiguous to said output means so as to be affected by said output signal whereby organic pain is suppressed in said affected body without causing noxious sensations despite receipt of said output signals by said affected body over an extended period of time.

4,014,348
SMOKING MIXTURE

Edward Garner, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

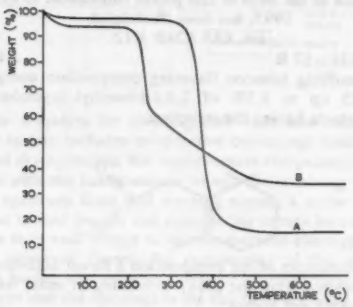
Filed June 9, 1975, Ser. No. 584,955
Claims priority, application United Kingdom, July 5, 1974, 29898/74
Int. Cl.² A24B 15/00
U.S. Cl. 131—2 **9 Claims**

1. An improved smoking mixture comprising cellulose or a modified cellulose as smoke-producing fuel and up to 5% by weight of melamine.

4,014,349
SMOKING MATERIAL

James Forrester Morman, and James Brown Parker, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 386,428, Aug. 7, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,429
Claims priority, application United Kingdom, Aug. 31, 1972, 40324/72
Int. Cl.² A24B 13/00; A24D 1/18
U.S. Cl. 131—2 **8 Claims**



1. In a process for the production of a tobacco substitute wherein a carbohydrate is subjected to catalytic thermal degradation in the presence of a non-toxic catalyst selected from the group consisting of a strong acid, a salt of a strong acid and a weak base, an alkali hydroxide or an alkali salt of a weak acid, the modification which comprises carrying out the degradation at a temperature significantly in excess of 250° up to 300° C until the weight of the residue is from 65 to 90% of the weight of the original carbohydrate and recovering said residue so as to avoid significant formation of anhydro-sugar and smaller organic molecules.

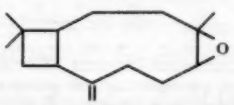
4,014,350
AROMATIC COMPOSITIONS

Edouard Demole, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

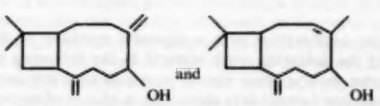
Division of Ser. No. 482,776, June 24, 1974, Pat. No. 3,920,027, which is a division of Ser. No. 219,136, Jan. 19, 1972, Pat. No. 3,840,023. This application June 12, 1975, Ser. No. 586,386
Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72
Int. Cl.² A24B 15/00
U.S. Cl. 131—17 R **3 Claims**

3. A tobacco flavouring composition which comprises at least one compound selected from the group consisting essentially of:

a. caryophyllenepoxide of formula



b. and c. caryophyllene alcohols of formula



4,014,351

NOVEL TOBACCO FLAVORING AND AROMA COMPOSITIONS AND TOBACCOS CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE

Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

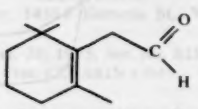
Continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application July 24, 1975, Ser. No. 598,652

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.² A24B *3/12*

U.S. Cl. 131—17 R **3 Claims**

3. A smoking tobacco flavoring composition comprisjng from 0.25 up to 1.5% of 2,6,6-trimethyl-1cyclohexen-1-ylacetaldehyde having the structure:



and the remainder of the composition a flavor adjuvant compound selected from the group consisting of ethyl butyrate, ethyl valerate and maltol.

4,014,352

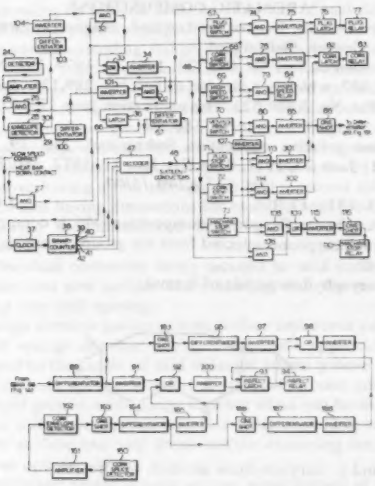
APPARATUS FOR AUTOMATICALLY CONTROLLING THE INITIATION AND/OR TERMINATION OF FUNCTIONS OF APPARATUS OR PROCESSES USING A CLOCK PULSE GENERATOR

Patrick J. Jamieson, Bramalea, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Division of Ser. No. 504,549, Sept. 9, 1974, Pat. No. 3,911,331. This application May 2, 1975, Ser. No. 573,918

Int. Cl.² A24B *7/14;* **A24C** *5/32, 5/34*

U.S. Cl. 131—21 R **18 Claims**



1. In combination with a cigarette machine of the type having the following work stations in the following order: a cigarette making work station at which cigarette paper and tobacco are formed into cigarettes, a plug feeding work station at which plugs are fed into said machine and are arranged end to end with said cigarettes and a cork tip paper feeding work station at which cork tip paper is fed into said machine and wrapped around said plugs and said cigarettes: apparatus for controlling the initiation of various machine functions in timed relationship to the occurrence of an event, said apparatus comprising a clock pulse generator for providing, when activated, a train of clock pulses which occur one after the other in sequential, spaced apart relationship; means responsive to cigarettes being made at said cigarette making work station in a normal fashion for activating said clock pulse generator; means having a plurality of output terminals for translating said train of clock pulses into a plurality of pulse signals that are derivable from individual ones of said output terminals, one such pulse signal being derivable at each of said output terminals and the pulses of different ones of said pulse signals occurring at different points in time; first and second networks, said first network including a first two state device, said first two state device controlling the supply of plugs to said plug feeding work station, said first two state device initiating said supply of plugs when said state thereof changes from one state to a second state thereof and terminating said supply of plugs when said state thereof changes from said second state to said one state thereof, said second network including a second two state device, said second two state device controlling the supply of cork tip paper to said cork tip paper feeding work station, said second two state device initiating said supply of cork tip paper when said state thereof changes from one state to a second state thereof and terminating said supply of cork tip paper when said state thereof changes from said second state to said one state thereof, said first and second networks being connected to at least one of said output terminals and each being responsive to the occurrence of a pulse at said output terminal to which said network is connected for changing the state of said two state device of said network from said one state to said second state thereof.

4,014,353

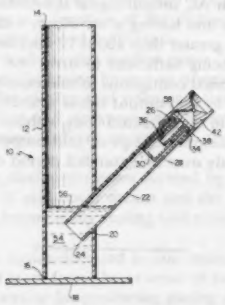
FLUID-COOLED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Filed May 14, 1976, Ser. No. 686,418

Int. Cl.² A24F *1/30*

U.S. Cl. 131—173 **30 Claims**



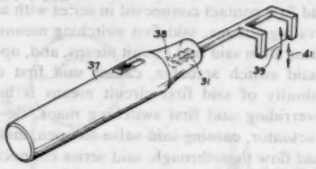
1. A fluid-cooled smoking device comprising:
housing means for containing a volume of fluid;
means for containing a supply of tobacco to be smoked;
means operatively connected to said tobacco container means for introducing smoke into said housing;
means operatively connected to said housing for withdrawing said smoke from said housing; and
means disposed within said smoke introduction means for defining a first elongated serpentine flow path for said smoke upstream of said fluid,
whereby said smoke is cooled due to the travel of the same through said elongated path and said fluid.

4,014,354

DENTAL FLOSSING TOOL

Terry N. Garrett, 2725 Dundee Court, Fort Collins, Colo. 80521

Filed Oct. 3, 1975, Ser. No. 619,443
Int. Cl.² A61C 15/00
U.S. Cl. 132—90 11 Claims



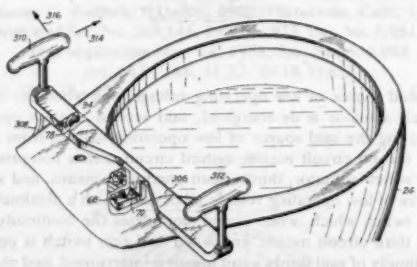
1. A dental flossing tool comprising:
a handle having a longitudinal axis and first and second ends; and
a pair of spaced-apart arms disposed on said handle at said first end thereof,
said arms each having a first portion extending laterally from said handle in a first direction and a second portion extending from said first portion in a second direction, said first and second portions forming substantially an L-shaped geometry;
the second portions of said arms being disposed for holding a length of dental floss between said arms in parallel alignment to the axis of said handle.

4,014,355

BIDET AND HYGIENIC CLEANSING ARRANGEMENT

Paul L. DiMatteo, Huntington; Henry V. Diaferia, Brentwood, and Robert M. Segnini, Stonybrook, all of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,743
Int. Cl.² A47K 10/48; A61H 33/00; B08B 3/02, 3/10
U.S. Cl. 134—30 17 Claims



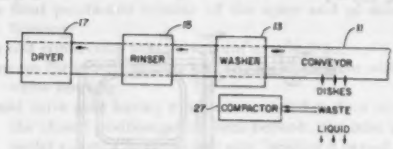
1. A cleansing method comprising the steps of: moving a spray of cleaning fluid over a predetermined area and moving thereafter a stream of air over sand area to dry said area after having been wetted by said cleansing fluid; said spray of cleansing fluid and stream of air being moved over said area beneath the top rim opening of a receptacle; heating said cleansing fluid and said stream of air; applying pressure to said cleansing fluid and said stream of air, said pressure being applied selectively and separately for said fluid and said air; said steps of moving said spray of cleansing fluid and said stream of air comprising further moving said spray and said stream of air reciprocatingly along an axis traversing said area, the path of motion traced by said spray and said stream of air with respect to said axis having a predetermined amplitude and frequency; said spray and said stream of air being movable along a line relative to the rim of said receptacle.

4,014,356

CLEANING SYSTEM FOR DISHWARE AND RELATED ITEMS

Carl R. Carieri, 64 Autumn Ridge Road, Trumbull, Conn. 06611

Filed Aug. 27, 1975, Ser. No. 608,224
Int. Cl.² B08B 3/10, 1/00, 5/00
U.S. Cl. 134—63 4 Claims



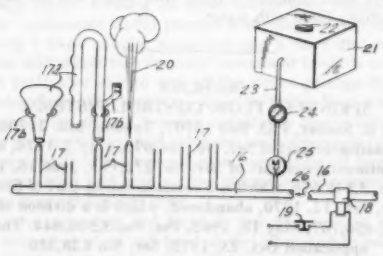
1. In a system for cleaning dish ware and related items which system includes cooperative conveying, washing, rinsing and drying means, the improvement comprising in combination with the said means a trough for receiving refuse located upstream from said washing means, a screw conveyor located in said trough and compacting means located downstream from said trough to receive material conveyed by said screw conveyor thereto for compacting of the same, said trough having a foraminous sub-floor located below the screw conveyor and the openings in the sub-floor are sized to permit passage into said trough of only relatively fine solid particulate matter and liquid matter and including pneumatic means located along the periphery of the trough directed downward through said screw toward the foraminous sub-floor for forcing refuse against the flights of the screw and for agitating the relatively fine particulate and liquid through the foraminous sub-floor material.

4,014,357

BEAKER STEAMER

Allen L. Sneed, Lot 59 Woodville Manor, Magnolia, Del. 19962

Filed Dec. 15, 1975, Ser. No. 640,763
Int. Cl.² B08B 3/02, 9/08
U.S. Cl. 134—102 1 Claim

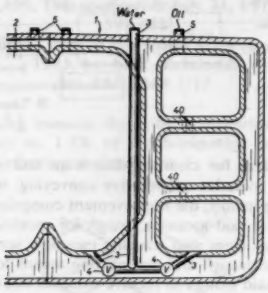


1. A beaker steaming device, comprising a safety solenoid valve secured within a horizontal pipe carrying steam and having plunger type safety switch means, said switch means is actuated to stop the high pressure steam flow within said horizontal pipe and said horizontal pipe is provided with a plurality of spaced apart jets for directing a mixture of steam and solvent, into the openings of vessels to be cleaned, said vessels being received removably within bracket means fixedly secured to the back wall of a housing, and line means from a solvent tank is secured fixedly to said horizontal pipe and has secured therein metering gauge means for controlling the flow of said solvent to said pipe carrying said steam.

4,014,358
LOADING AND UNLOADING OF COMBUSTIBLE LIQUIDS ON, AND FROM TANKER SHIPS

Louis Andersson, Gatgatan 73 IV, S-116 72 Stockholm, Sweden

Continuation of Ser. No. 431,873, Jan. 9, 1974, abandoned. This application July 11, 1975, Ser. No. 595,029
Int. Cl.² B63B *25/08*
U.S. Cl. 137—1 **2 Claims**



1. Method of unloading oil from the tank holds of a tanker and replacing it with ballast water, by exchanging oil located in the tank holds of a tanker ship and water located in a storage tank on land, comprising the steps of:

simultaneously withdrawing oil from the tank hold while supplying water from said storage tank to the tank hold by removing, by differential pressure, oil from the upper level of the tank hold while simultaneously introducing water into the same tank hold at the lower level of the tank hold,

the introduction of the water comprising the following sequence of steps:

a. first filling a tank hold of the tanker ship completely with water;

b. subsequent to filling that tank hold with water, transferring a portion of the water from the filled tank hold into a second tank hold and then adding more water until the second tank hold is completely filled;

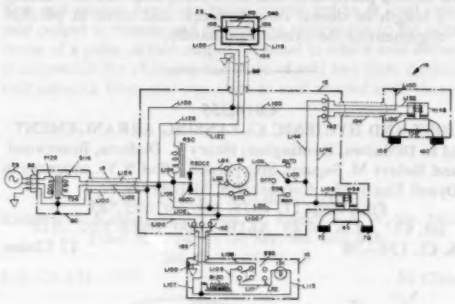
repeating the steps of (a) completely filling a tank hold with water and then (b) partially withdrawing water from the filled tank hold, until all of the tank holds of the tanker have been completely filled with water and are at least partially filled with water.

4,014,359
SPRINKLER FLOW CONTROL SYSTEMS

George E. Sanner, P.O. Box 10707, Towson, Md. 21204

Continuation-in-part of Ser. No. 466,693, May 3, 1974, which is a continuation-in-part of Ser. No. 272,793, June 18, 1972, Pat. No. 3,848,616, which is a continuation-in-part of Ser. No. 18,829, Feb. 12, 1970, abandoned, which is a division of Ser. No. 456,787, May 18, 1965, Pat. No. 3,500,844. This application Oct. 23, 1975, Ser. No. 625,350
Int. Cl.² A01G *25/16*
U.S. Cl. 137—78 **53 Claims**

1. A flow control for a fluid flow system having a fluid conduit with an electrically actuated flow control valve therein, comprising: a step-down transformer providing means for reducing a source of operating voltage to a source of low operating voltage; a first circuit means for connecting the said source of low operating voltage to the valve actuator; a first switching means comprising timing means for automatically completing said first circuit means to energize the said valve actuator and thereby open the said valve and allow a flow of fluid through said conduit for a predetermined period of time, and upon completion of the said time period, said first switching means interrupts said first circuit means continuity causing said valve actuator to be de-energized, said valve to close, and terminate said fluid flow through said conduit; a second switching means comprising an electrically actuated, single pole, double contact, switch with a switch actuator, which when energized, causes a first contact to open and a second contact is closed, and when said switch actuator is de-energized, said first contact is closed and said second contact is opened; said first contact connected in series with said source of low operating voltage, said first switching means, and said valve actuator all in said first circuit means, and, upon energization of said switch actuator, causes said first contact to open, continuity of said first circuit means is interrupted, thereby, overriding said first switching mans, de-energizing said valve actuator, causing said valve to open, and terminating said fluid flow therethrough; said series connected circuit which, upon de-energization of said swich actuator, causes said first contact to close, restoring control of said first switching means, completing continuity of said first circuit means, energizing said valve actuator, causing said valve to open, and said fluid to flow therethrough; said second contact of said second switching means connected in series with a second circuit means and said source of low operating voltage, such that when said switch actuator is energized, the said second contact closes energizing the said second circuit means with

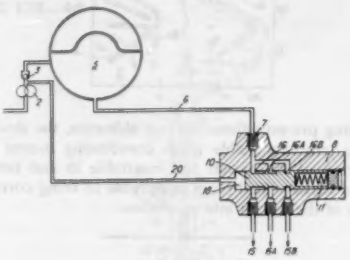


the said source of low operating voltage, and when the said switch actuator is de-energized, said second contact opens removing the said source of low operating voltage from the said second circuit means; a third circuit means comprising said switch actuator, third circuit conductor means, and said source of low operating voltage all in series with a planimetric rain switch which, when closed, completes the continuity of said third circuit means, and when said rain switch is open, continuity of said third circuit means is interrupted; said planimetric rain switch comprising an insulated member having a surface which is adapted to be oriented to receive rain thereon, with first and second spaced apart conductor means disposed on said surface and connected to said third circuit conductor means which are adapted to be electrically connected by rain on said insulating surface, completing the continuity in said third circuit means, energizing said switch actuator, causing said first contact to open, overriding said first switching means, interrupting said first circuit means, de-energizing said valve actuator, closing said valve, terminating said fluid flow therethrough; and, upon cessation of said rain on said insulating surface, interrupting said third circuit means, de-energizing said switch actuator, causing said first contact to close, and restoring control of said valve actuator to said first switching means substantially conterminously with said rain cessation.

4,014,360
PLURAL-SERVICE HYDRAULIC SYSTEM

Frederick John Adams, Campton, England, assignor to TRW Inc., Cleveland, Ohio

Filed May 31, 1974, Ser. No. 475,119
Claims priority, application United Kingdom, May 31, 1972, 25981/72
Int. Cl.² G05D *11/02*
U.S. Cl. 137—118 **9 Claims**

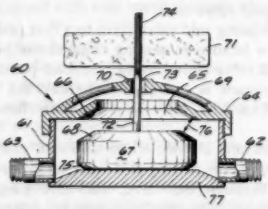


1. A hydraulic system in which a source of pressure-fluid charges a pressure accumulator and the accumulator supplies pressure fluid to first and further slave services with preselected priority of supply, characterized by the provision of valve means connected between the accumulator and the slave services and operated by the source pressure in opposition to resilience, a first line connecting the valve means to the contents of the accumulator and a second line connecting the valve means to the source of pressure-fluid whereby the valve means is acted upon directly by the source of pressure-fluid to operate the valve, the position of the valve means when so operated determining which of the further slave services receives pressure-fluid from the accumulator so that the selection of slave services to be supplied is dependent upon the source pressure.

4,014,361
AUTOMATIC ANTI-SIPHON VALVE

Chester C. Rodieck, P.O. Box 1329, Porterville, Calif. 93257

Division of Ser. No. 269,145, July 5, 1972, Pat. No. 3,951,163. This application Nov. 24, 1975, Ser. No. 634,905
Int. Cl.² F16K *31/22*; E02B *13/00*
U.S. Cl. 137—122 **1 Claim**



1. A float activated irrigation valve with anti-siphon action, for use in an irrigation basin with a pressurized source of water comprising, in combination:

a hollow valve housing having a side wall, one open end and one closed end;

an inlet connected through the side wall of said valve housing near the closed end thereof for connection to a source of pressurized water;

an outlet connected through the side wall of said valve housing opposite said inlet;

a valve gate freely fitted within the hollow of said valve housing, said valve gate having on one surface thereof a first valve seat, the thickness of said valve gate being greater than the diameter of said inlet or said outlet, such that water flowing from said inlet to said outlet when said valve gate is at the bottom of said housing will draw water through the open end of said housing, thereby breaking any siphon action;

a second valve seat fixedly connected to said hollow valve housing at said open end for mating with said first valve seat when said valve gate is in the closed position;

a float positioned outside of the open end of said valve housing;

a rod connecting said valve gate to said float;

means for loosely guiding said rod for movement within said valve housing;

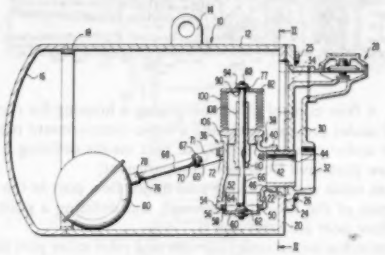
said valve gate having a bottom rounded surface so that in the closed position water from between the inlet and the outlet exerts a force on said gate, holding it sealed against said second valve seat; and

a raised section integral with said closed end projecting into the hollow of said valve housing for holding the top of said valve gate a distance above said inlet and said outlet to force water to travel up and over said valve gate.

4,014,362
SIMPLIFIED BALANCE VALVE STEAM TRAP

Eugene E. O'Neil; Robert H. Healy, and Anneus E. Eygabroad, all of Marshall, Iowa, assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,637
Int. Cl.² F16T *1/20*
U.S. Cl. 137—196 **2 Claims**



1. In a steam trap comprising an imperforate housing including means forming an upper steam inlet passage and a lower condensate outlet passage with said outlet passage including a fixed annular valve seat and a valve-disc mounted within said steam trap for axial movement towards and away from said valve seat to seal off the outlet passage discharge opening from the steam trap interior, and a float within the lower portion of said housing operatively connected to said valve disc for moving said valve disc away from said valve seat in response to a predetermined accumulation of liquid condensate within said housing, the improvement comprising:

a pressure balancing plate,

a valve actuating rod fixed at one end to said pressure balancing plate and fixed at the other end to said valve disc to place said pressure balancing plate and valve disc in axial alignment,

means for slidably mounting said valve actuating rod within a portion of said means defining said outlet passage, and

a bellows sealably fixed at one end to said means defining said outlet passage and extending concentrically about said valve actuating rod and being sealably fixed at the other end to the periphery of said pressure balancing plate;

said outlet passage means comprising a T-shaped pipe including a horizontal outlet base portion extending through an end wall of said housing, and integral vertical right angle arms open to the housing interior above and

below said base portion, said lower arm terminating in said annular valve seat, said valve rod extending from said valve disc through said valve seat and axialy through both arms, said means operatively connecting said float to said valve disc comprising a float arm fixed at one end to said float and fixed at the other end to a body yoke encompassing said T-shaped pipe, and body yoke being pivotably coupled to said pipe and to said vertically extending valve actuator rod, and wherein said tubular bellows is sealably, fixedly mounted at its upper end to said pressure balancing plate and its lower end to the upper end of said T-shaped pipe upper arm;

whereby, the pressures acting on the valve disc in valve closed position are balanced to reduce the power necessarily exerted by the float on the valve disc to move the valve disc to valve open position.

4,014,363

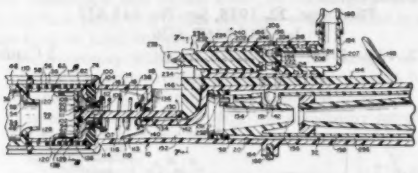
WATER AND CONCENTRATE SUPPLY VALVES FOR PROPORTIONING MIXER-DISPENSER

Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill. 60093

Division of Ser. No. 443,831, Feb. 27, 1974, Pat. No. 3,933,179. This application Apr. 17, 1975, Ser. No. 568,786

Int. Cl.² F16K *19/00*

U.S. Cl. 137—218 **11 Claims**



10. A flow control valve comprising a housing for receiving liquid under pressure, defining a valve compartment receiving liquid under pressure, and valve port means defining a major outflow port area from said compartment;

main valve means closing said major flow port in the direction of the flow therethrough and defining a pilot valve flow port area through it,

pilot valve means coacting with said pilot valve port to close said pilot valve in the direction of flow and opening against said pressure;

valve stem means for opening said pilot valve means to lower the pressure drop across the main valve means;

lost motion means interconnecting said valve means for sequentially opening the main valve means when extended after opening the pilot valve means to dispose them in spaced relation with a flow space therebetween in communication with said pilot valve port, and means to lower the pressure on the liquid flowing between the valves relative to the upstream pressure against the main valve means to collapse said lost motion means and further open said main valve.

4,014,364

UNIVERSAL CIRCUIT-DEFINING DEVICE

Pierre Matrot, Fontenay-sous-Bois, France, assignor to Martonair Limited, Twickenham, England

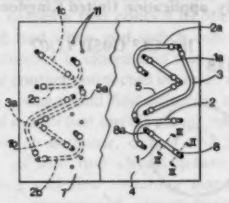
Filed May 29, 1975, Ser. No. 581,736

Claims priority, application France, May 29, 1974, 74.18664

Int. Cl.² F15C *1/06*

U.S. Cl. 137—271 **4 Claims**

1. A universal circuit-defining device with which logical or other component elements or modules of component elements are to be connected, the device including a base plate having opposed faces, open channels provided in one of said opposed faces and sockets formed in said open channels, a deformable seal engaging said one face and by which said open channels are closed, and a cover plate by which said deformable seal is held against said one face, said channels



constituting pre-established circuit elements, the device also including interchangeable plugs constituting means for the interruption of the cirucit and insertable in and removable from said sockets, said plugs removable to bring corresponding parts of the circuit into operation.

4,014,365

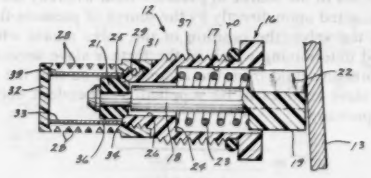
VALVE

Jerry D. Peterson, Conrad, and Gerald L. Knief, Grundy Center, both of Iowa, assignors to Ritchie Industries, Inc., Conrad, Iowa

Filed Oct. 10, 1975, Ser. No. 621,468

Int. Cl.² E03B *3/18*

U.S. Cl. 137—549 **2 Claims**



1. A valve comprising:

a valve body having a fluid passageway therethrough said fluid passageway being disposed about a longitudinal axis, one end of said passageway formimg a fluid inlet port and the other end of said passageway forming an outlet port;

a valve seat disposed at said one end of said passageway;

a valve stem extending through said passageway;

a valve head disposed on one end of said valve stem adjacent to said valve seat;

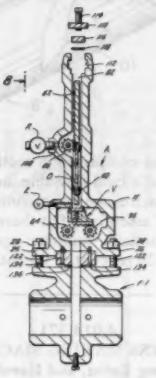
means for biasing said valve stem to a first position whereby said valve head is in sealing engagement with said valve seat, said valve stem having a second position when said biasing means is overcome whereby the valve head is spaced from the valve seat to allow flow through the valve;

screening means connected to said one end of said valve body and encompassing said valve head for filtering fluids passing through the valve, said screening means being substantially cylindrical and having sidewalls which are pervious to fluid flow and having one end wall which is impervious to fluid flow; and

a cylindrical sleeve member disposed within said screening means, said cylindrical sleeve member having a single hole in the side thereof positioned directly adjacent to said valve head when said valve head is in said first position whereby said valve head will slide past said hole when moving between said first and second positions to prevent the build-up of mineral deposits in said hole, said cylindrical member having one end thereof in sealing engagement with said flow impervious one end of said screening means and the other end of said cylindrical

member being in sealing engagement with a portion of said housing surrounding said valve seat, said hole being intermediate the ends of said cylindrical member.

4,014,366
ORIFICE FITTING CONVERSION APPARATUS
Morris K. Critendon, P.O. Box 1639, Houston, Tex. 77001
Continuation of Ser. No. 451,934, March 18, 1974, abandoned. This application July 28, 1975, Ser. No. 599,381
Int. Cl.² F16D *1/00*
U.S. Cl. 138—44 **9 Claims**



1. An apparatus for mounting with and converting a junior or simplex orifice fitting in a pressurized fluid line to a senior fitting so that an orifice plate in the junior fitting is thereafter removable therefrom for service and repair without loss of pressure in the line, comprising:

an adapter housing having:

an upper portion;

a lower portion having a lower portion surface;

a vertical upper chamber formed in said upper portion and having an upper end and a lower end;

a lower chamber formed in said lower portion and having an upper end and a lower end;

said lower end of said upper chamber adjoining said upper end of said lower chamber by a passage formed therebetween; and

said lower chamber formed having a slot extending between said lower portion surface and said lower end of said lower chamber, said slot being substantially vertically aligned with said vertical upper chamber and said passage;

an adapter plate having:

an upper surface for engaging said lower portion surface of said adapter housing;

a central member extending downwardly from said upper surface of said adapter plate; and,

said central member formed having an opening therein, said opening in substantial vertical alignment with said slot, said passage and said upper chamber;

fastening means for mounting said adapter plate with said adapter housing;

an orifice plate carrier mounted for movement in said adapter housing from a lower position wherein said orifice plate carrier extends from said lower chamber through said slot and said opening to an upper position wherein said orifice plate carrier is entirely disposed within said upper chamber;

lower moving means for moving said orifice plate carrier vertically between the lower position and an intermediate position between the lower position and the upper position, said lower moving means mounted with said lower chamber;

upper moving means for moving said orifice plate carrier to and from the upper position, said upper moving means moving said orifice plate carrier vertically between the intermediate position and the upper position, said upper moving means mounted with said upper chamber;

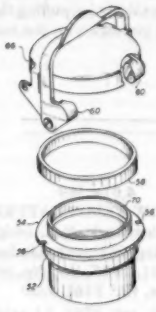
a closure valve movably mounted in said lower chamber for movement to and from a closed position adjacent said passage;

means for moving said closure valve in said lower chamber between an open position when said orifice plate carrier is in the intermediate position and the closed position when said orifice plate carrier is in the upper position or the lower position;

vent valve means mounted with said upper chamber for relieving fluid pressure from said upper chamber when said closure valve is in the closed position and said orifice carrier plate is in the upper position; and,

a service opening adjacent said upper end of said upper chamber of said upper portion to provide access to said orifice plate carrier for service and repair thereof when said orifice plate carrier is in the upper position in said upper chamber.

4,014,367
PIPE CAP
August Milo, 1015 Schleifer Road, Hillside, N.J. 07205
Division of Ser. No. 516,324, Oct. 21, 1974, Pat. No. 3,949,787. This application May 6, 1975, Ser. No. 574,999
Int. Cl.² F16L *55/10*
U.S. Cl. 138—89 **5 Claims**



1. a pipe capping system for capping the end of the pipe, said system comprising:

a pipe end having an exterior, circular rim section of major diameter D_r, said rim section including flat upper and lower surfaces thereon, said rim section further including two slots located on said diameter D_r, said slots being separated by a distance D_s; and,

a pipe cap including a cover for sealing said pipe end an extended arm, and a handle pivotally connected to the face of said extended arm by a pivot means, said handle including a rim section engaging lug means for locking said cover in a locking position against said flat lower surface of said rim section when said handle is rotated in a first direction and for unlocking said cover to an unlocked position when said handle is rotated in a second direction, said lug means being located a distance D_l apart, where

$D_s > D_l$ for all values for D_s and D_l,

said lug means comprising a pair of inwardly facing, opposing lugs, said lugs including at least one substantially flat surface thereon, said lug means being located between said pivot means and said rim section when said handle is in said locking position.

4,014,368

FLANGE PROTECTOR

John E. Nelsen, Fairview, Pa., assignor to Alliance Plastics, Inc., Erie, Pa.

Filed Feb. 13, 1976, Ser. No. 657,734
Int. Cl.² B65D 59/06
U.S. Cl. 138—109 3 Claims

1. A flange of the type having an inner annular machined surface surrounded by an outer surface with bolt holes extending through said flange, and a protector comprising a single piece of flexible impact resistant material having

a. a cover extending over and around said inner surface with an edge of the cover engaging said outer surface

b. an outer section integral with the cover and extending over the bolt holes and engaging said outer surface of the flange

c. hollow thinble-like fasteners having

i open upper ends

ii hollow body portions depending from said outer section and received in said holes by finger pressure on said upper ends and making a fastening by friction contact with the bores of said holes

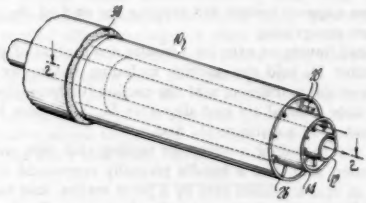
iii and the lower ends of said body portions when received in said holes being accessible to finger pressure for pushing the fasteners out of the holes, said fasteners when received in said holes pulling the flange protector into conforming contact with the outer surface of the flange.

4,014,369

TRIPLE PIPE LOW TEMPERATURE PIPELINE

Adolph Kobres, Jr., Glen Rock, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,676
Int. Cl.² F16L 9/00
U.S. Cl. 138—112 9 Claims



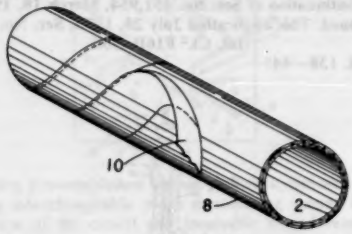
1. A pipe section for use in a pipeline system comprising: a first pipe, a second pipe radiallyspaced from said first pipe in coaxial relation and connected therewith to define a first annulus therebetween, a third pipe connected in coaxial radially-spaced relation with said second pipe for restraining movement thereof and defining a second annulus therebetween, radial rib means connected between said first and second pipes and between said second and third pipes respectively, for interlocking said coaxial pipes to minimize thermal movement of said system and substantially eliminate axial differential thermal movement between said pipes, and insulation means disposed in said second annulus.

4,014,370

OUTER WRAP FOR PIPELINES

Frank E. McNulty, R.R. No. 1, Box 113, Siloam Springs, Ark. 72761

Filed Sept. 22, 1975, Ser. No. 615,388
Int. Cl.² F16L 9/02, 9/14, 9/16
U.S. Cl. 138—144 10 Claims



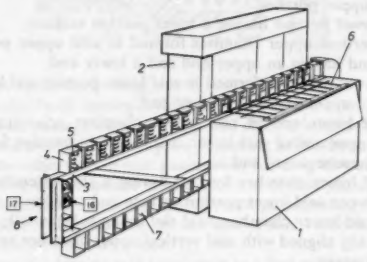
1. The combination comprising a section of metal conduit coated with a layer of a cold flowable, adherent, waterproofing material over which is wound a continuous strip of a porous fabric woven of essentially flat thermoplastic fibers, said fabric having substantially uniform openings that provide approximately 15 to 20 percent of the total area of said fabric.

4,014,371

MATTRESS MAKING MACHINERY

Bertram Walker, Long Eaton, and Harold Fred Beviss, Ilkeston, both of England, assignors to Elson & Robbins Limited, Long Eaton, England

Filed Dec. 30, 1974, Ser. No. 537,465
Claims priority, application United Kingdom, Jan. 10, 1974, 1158/74
Int. Cl.² B21F 27/00, 45/16
U.S. Cl. 140—3 CA 6 Claims



1. Apparatus for the manufacture of spring interior units from a coil of wire which comprises in combination more than one conventional hour-glass forming spring machine, means for feeding the springs so formed from each of said spring forming machines alternatively one from each side to opposite sides of a conveyor having individual pocket members for locating individual hour-glass springs, means for feeding the springs in the conveyor to a station whereat a predetermined plurality of the springs may be displaced from the conveyor simultaneously, means for simultaneously displacing the predetermined plurality of springs from the conveyor, means for positioning the plurality of springs in a first row relative to another plurality of springs in a second row between an upper and lower press member each having a lateral groove in their opposing flat faces and means for moving one of said press members toward the other to simultaneously compress said first and second rows of hour-glass springs with the end convolutions of springs in each row adjacent said lateral grooves in position to wind a convoluted spring around the end convolution of adjacent springs as said convoluted spring is passed

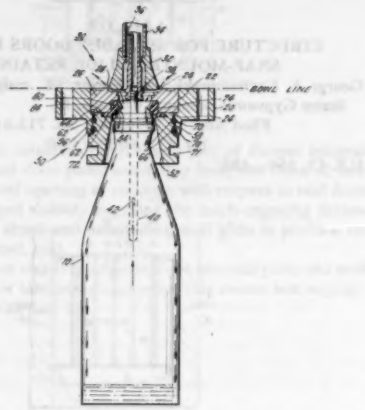
from a convoluted die through said lateral groove with said hour-glass springs in compressed condition and means for repeating the operation until a plurality of rows have been joined together at their end convolutions.

4,014,372

BOTTLING MACHINE, FILLING VALVE BELL AND SEALING GASKET

Anthony J. Dichiara, 10 St. Paul's Crescent, Garden City, N.Y. 11530

Filed Sept. 8, 1975, Ser. No. 611,463
Int. Cl.² B65B *3/18*
U.S. Cl. 141—392 **33 Claims**



1. A bottle filling apparatus comprising; a bottle filling valve assembly, a bottle centering bell and a bottle lip sealing gasket;

said bottle filling valve assembly comprising: a retainer element; liquid flow passage means communicating through said retainer element; a liquid inlet valve in said retainer element flow passage means; said flow passage means and said valve being shaped so as to direct liquid passing through and past them into a bottle positioned beneath said flow passage means;

said bell being located beneath said retainer element and beneath said flow passage means; said bell comprising a body having a first opening therethrough, and first side walls defining said first opening; said first side walls being shaped such that said bell is able to pass over a bottle placed in said first opening and said first side walls being so positioned and shaped as to direct a bottle whose upper end is in said first opening to be beneath said flow passage means;

cooperating snap fastening means on said bell and said retainer element for holding said bell beneath said retainer element and for enabling snap-in connection and disconnection of said bell and said retainer element;

said bottle lip sealing gasket being positioned and adapted for engaging the lip of a bottle whose upper portion is in said bell first opening; said gasket being located in said first opening of said bell; means in at least one of said bell and said retainer element for supporting said gasket.

4,014,373

VEHICLE FOR REMOVING AND COMMINUTING STANDING TREES

Stuart L. Smith, 506 N. Center Ave., Merrill, Wis. 54452

Filed Feb. 13, 1976, Ser. No. 657,890
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **11 Claims**

1. An apparatus for harvesting and comminuting entire standing trees comprising:

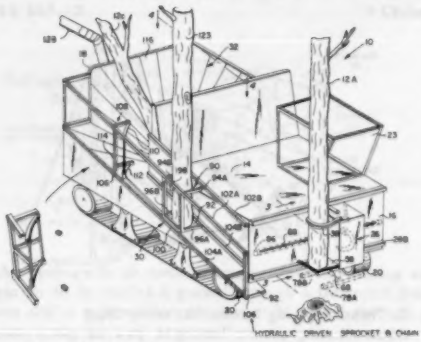
a vehicle comprising a body having forward and rear ends and sides and ground engaging traction means;

tree removing means on the forward end of said vehicle comprising:

grip means to engage and hold a tree to be harvested in a vertical position;

shear means for severing and supporting a harvested tree;

means to index said tree removing means from a shearing



position proximate one side of said body to a transfer position proximate the other side of said body;

inclined conveying means on said other side of said body and operable between a forward position at the forward end of said body and a rearward position at the rearward end thereof to convey and elevate trees therebetween;

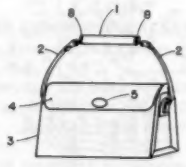
comminuting means at said rearward end including means to receive an entire tree and crush its branches while feeding the entire tree under positive drive thereto.

4,014,374

ANTI-THEFT CARRYING BAG

Aubrey Franklin Douglas, Sr., Rte. 1, Box 182B2, Petersburg, Va. 23803

Filed May 17, 1976, Ser. No. 687,254
Int. Cl.² A45C *3/06, 13/18*
U.S. Cl. 150—33 **6 Claims**



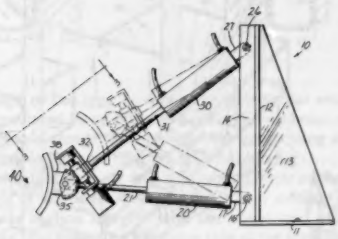
1. In a carrying bag comprising a container and carrying means therefor, the improvement comprising an anti-theft device associated with said carrying means, said anti-theft device comprising a tubular housing, a line stored in a rapidly deployable configuration within said housing, closure means engaged with at least one end of said housing, said closure means being attached to both an end of said line and said container, said closure means being removable from said housing by a force exceeding the weight of said container and its contents.

4,014,375

THRUST-APPLYING MECHANISM FOR TIRE CHANGING APPARATUS

S. W. Malinski, Tamaroa; Thomas L. Mueller, and Jerome A. Gross, both of St. Louis, all of Mo., assignors to S. W. Malinski, Tamaroa, Ill.

Filed Nov. 5, 1975, Ser. No. 629,017
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.17 **7 Claims**



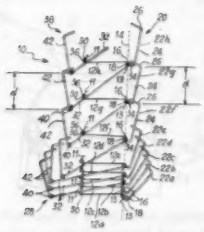
7. Thrust-applying mechanism comprising
thrust-reacting means having a pair of pivot mounting points on parallel axes,
a pair of linear actuators, one end of each being mounted to one of said pivot mounting points,
the other ends of said actuators having bored fittings,
a common shaft through the bored fittings of said actuators,
whereby said common shaft and pivot mounting points hold said acuators in a plane and whereby the intersection of the shaft with said plane is moveable therein on extending and retracting said actuators relative to each other,
a thrust-applying shoe pivot-mounted on said shaft, and
controllable rotation-resisting means, operably connected between said shoe and one of said actuators, to fix and vary the angle at which said thrust-applying shoe is held relative to said actuator.

4,014,376

WINDOW BLINDS

Paul Plom, and Jean-Paul Plom, both of Route Nationale 7, Pougues-les-Eaux 58320, France

Filed Dec. 15, 1975, Ser. No. 640,988
Int. Cl.² E06B *9/30*
U.S. Cl. 160—172 **8 Claims**



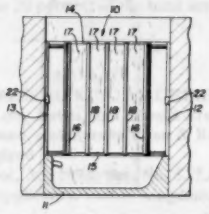
1. Window blind construction comprising similarly shaped thin elements, each of which is in a pivotable and slidable relationship by one of its opposed rectilinear edges to at least two parallel side grooves, a fastening system connecting to one another the rectilinear edges of the different thin elements associated with the grooves so as to allow regular unfolding of these latter starting from a position of storage where they are arranged adjacent each other, and an operating system controlling the unfolding and storing of the thin elements, and an adjusting system connected to each of the free remaining rectilinear edges of the different elements to control the inclination of these latter and/or their mutual interconnection when these elements are provided along the length of their rectilinear edges with two oppositely directed flanges, the adjusting system including at least one group of rigid supporting elements each mounted to pivot about a swivel pin extending from the rectilinear edge associated with the groove of one of the thin elements to cooperate with an abutment extending from the free edge of the lower adjacent thin element, and a connecting means fastening the free ends of these supporting elements to one another to control simultaneously their pivoting and inclination and/or the mutual interconnection of the thin elements each time these latter are in an unfolded position.

4,014,377

STRUCTURE FOR SLIDABLE DOORS HAVING SNAP-MOUNTED GLIDE RETAINER

George A. Kochanowski, Lake Forest, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,618
Int. Cl.² E05D *15/50*
U.S. Cl. 160—186 **19 Claims**



1. A resiliently mountable panel structure for slidable doors comprising:
A. A door panel having an elongated opening therethrough,
B. Resilient mounting means on said panel and engageable with a rail for moving the panel on the rail comprising:
1. A glide comprising:
a. A body disposed on one side of said panel,
b. Projecting means on said body engageable with said rail for movement of said glide thereon, and
c. A shank on said body extending through said panel opening and moveable therein for relative movement of said glide and said panel, said shank being provided at each end with latch-engaging means,
2. A glide retainer mounted on the reverse side of said panel comprising a generally C-shaped body and latching means at each end engaging the latch-engaging means of said shank and maintaining said glide in position on said panel, and
3. Resilient means interposed between said glide and said panel for tensioning said projecting means into engagement with said rail.

4,014,378

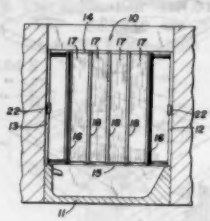
STRUCTURE FOR SLIDABLE DOORS HAVING GLIDE RETAINER INTEGRAL WITH DOOR PANEL

George A. Kochanowski, Lake Forest, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,619
Int. Cl.² E05D *15/50*
U.S. Cl. 160—186 **7 Claims**

1. A resiliently mountable panel structure for slidable doors comprising:
A. A door panel having an elongated opening therethrough,
B. Resilient mounting means on said panel and engageable with a rail for moving the panel on the rail comprising:
1. A glide comprising:

a. A body disposed on one side of said panel,
b. Projecting means on said body engageable with said rail for movement of said glide thereon, and
c. A shank on said body extending through said panel opening and moveable therein for relative movement of said glide and said panel, said shank being provided at each side with latch-engaging means,



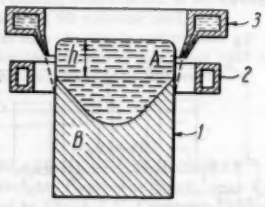
2. A glide retainer comprising a pair of flanges integral with said door panel extending from the sides of said elongated opening at an angle with respect to said door panel and slidably engaging the latch-engaging means of said shank and maintaining said glide in position on said panel, and
3. Resilient means interposed between said glide and said panel for tensioning said projecting means into engagement with said rail.

4,014,379

METHOD OF FORMING INGOT IN PROCESS OF CONTINUOUS AND SEMI-CONTINUOUS CASTING OF METALS

Zinovy Naumovich Getselev, prospekt Metallurgov, 73, kv. 29, Kuibyshev, U.S.S.R.

Continuation of Ser. No. 44,752, June 9, 1970, abandoned. This application July 3, 1972, Ser. No. 268,689
Int. Cl.² B22D *11/02, 27/02*
U.S. Cl. 164—4 **2 Claims**



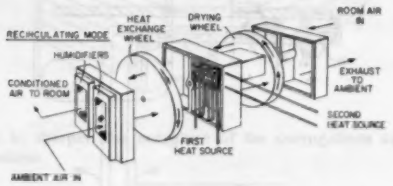
1. A method of forming an ingot in the process of continuous and semi-continous casting of metals, which method comprises the steps of shaping the molten metal by an electromagnetic field of an inductor; adjusting the current flowing through the inductor depending on the deviations of the height of the liquid zone of the ingot from a prescribed level to maintain the prescribed transverse dimensions of the liquid zone wherein the level of said liquid zone of the ingot is measured, and the obtained magnitude is converted into an electrical signal which acts to adjust the current flowing through the inductor in the direction providing for the maintenance of the prescribed transverse dimensions of the liquid zone of the ingot; and thereafter cooling the molten metal until the molten metal is at least partially solidified.

4,014,380

AIR CONDITIONING PROCESS

William F. Rush, Arlington Heights; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Nov. 4, 1974, Ser. No. 520,616
Int. Cl.² F23L *15/02*
U.S. Cl. 165—2 **9 Claims**



1. An open-cycle air conditioning process for cooling air wherein air to be cooled is passed through a treatment passageway and a regeneration air stream is passed through a separate regenerative air passageway comprising the steps:
passing air to be cooled through a treatment air passageway and in sequence adiabatically drying the treatment stream by a desiccant means, transferring sensible heat resulting from the adiabatic drying by a sensible heat exchanger means for the treatment air stream to the regeneration air stream and evaporatively cooling the treatment air stream with water to provide conditioned air having desired temperature and humidity; and
passing a regeneration air stream through a separate regeneration air passageway countercurrent to said treatment air stream and in sequence regenerating said sensible heat exchanger means by absorbing heat in the regenerative air stream, the entire regenerative air stream from said heat exchanger means being further heated by passing a low temperature heater means between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream, splitting said regenerative air stream into a first and a second portion, said first portion passing directly through a segment of said desiccant means to partially regenerate said segment and said second portion being further heated by passing a high temperature heater means and than passing said second portion through the segment of said desiccant means partially regenerated by said first stream at a sufficient temperature to complete regeneration of said desiccant means segment.

4,014,381

AIR CONDITIONING SYSTEM

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 527,991, Nov. 29, 1974, Pat. No. 3,952,795. This application Jan. 20, 1976, Ser. No. 650,660
Int. Cl.² F25B *29/00*
U.S. Cl. 165—2 **1 Claim**

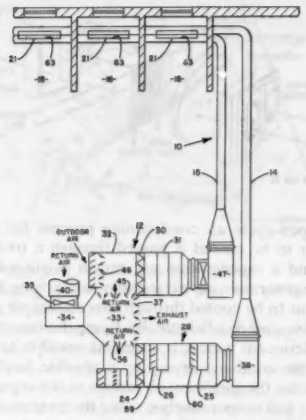
1. A method of operating an air conditioning system for conditioning air in a plurality of enclosed areas in a building, each of the enclosed areas having a peripheral portion requiring conditioned air having a variable temperature, and an interior portion requiring conditioned air at a constant temperature, comprising the steps of:
delivering a first conditioned air stream to a terminal serving the peripheral portion of said area, the temperature of said conditioned air being varied in accordance with the temperature of the ambient air;
delivering a second conditioned air stream to a terminal serving the interior portion of said area, the temperature of said air being maintained at a relatively constant level;

regulating the quantity of the relatively constant temperature conditioned air discharged from said terminal to said area in accordance with the temperature conditions within the area;

generating a control signal, the magnitude of the signal varying in accordance with the quantity of constant temperature conditioned air supplied to the area;

sensing the temperature of the first conditioned air supply;

delivering the control signal, when the temperature of the first conditioned air supply is relatively warm, to a control



operable to regulate the quantity of said relatively warm conditioned air discharged into said area from the first terminal portion;

increasing the quantity of relatively warm air discharged into said area when the magnitude of the control signal varies to indicate that the quantity of said constant temperature air discharged into said area is decreasing; and

decreasing the quantity of relatively warm air discharged into said area when the magnitude of the control signal varies to indicate that the quantity of said constant temperature air discharged into said area is increasing.

4,014,382

TEMPERATURE AND/OR RELATIVE HUMIDITY CONTROL SYSTEM

Walter I. Heath, Monnford, Okla., assignor to Basil E. Demeur, Chicago, Ill.

Filed May 21, 1975, Ser. No. 579,322

Int. Cl.² F24F *3/14*

U.S. Cl. 165—60 **19 Claims**

1. A device for controlling the relative humidity of a gas utilized in connection with a lift support system comprising, in combination,

a chamber bounded by a bottom wall, peripheral side walls, and a top wall, and adapted to receive and hold a quantity of fluid for humidifying a gas therein,

said chamber provided with a gas inlet and a gas outlet,

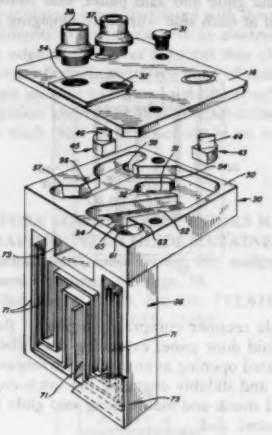
gas spider means associated with said gas inlet, said gas spider means providing gas passageways for segregating portions of said gas provided to said system through said gas inlet,

gas proportioning valve means positioned in association with said gas spider means and in line with said gas inlet thereby to permit the independent variable proportioning of gas to at least two down line gas passageways,

at least a first passageway traversing said gas spider means and terminating at said gas outlet, and at least a second gas passageway traversing said gas spider means and in fluid communication with said chamber,

said gas outlet being in fluid communication with said chamber and with said first passageway in said gas spider means,

whereby gas introduced into said system through said gas inlet may be variably adjusted to direct a portion of said gas through said gas spider means to said gas outlet and



another portion of said gas directed to a second passageway for introduction into said chamber to humidify the same and exiting said humidified gas into a passageway to mix with said first gas portion thereby forming a gas mixture having a controlled relative humidity.

4,014,383

METHOD OF HEATING HEAT EXCHANGER UNIT

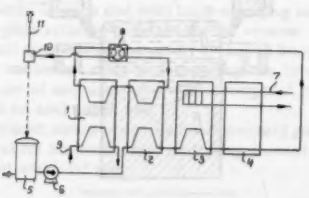
Nils Lennart Stolt, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jan. 20, 1975, Ser. No. 542,590

Claims priority, application Sweden, Feb. 25, 1974, 74024548

Int. Cl.² F28F *27/02*

U.S. Cl. 165—95 **1 Claim**



1. In the operation of a heat exchanger unit having a heating section for heating a product and also having a regenerative section through which the product passes for preheating it before reaching the heating section and through which the product again passes to recover heat therefrom after leaving the heating section, the method which comprises passing the product countercurrently through the regenerative section as the product flows to and from the heating section, and heating the unit, as for cleaning or sterilizing, by passing a liquid other than said product in a first flow through the regenerative section to and through the heating section and thence back through the regenerative section in a second flow which is concurrent to said first flow.

4,014,384

BREATHING GAS HEATER FOR USE BY A DIVER COMPRISING DOUBLE WALLED CYLINDER AND INNER CONTAINER FILLED WITH HOT LIQUID PRIOR TO USE

Douglas Larry Marcus, 2814 Smith Ave., Baltimore, Md. 21209

Continuation-in-part of Ser. No. 457,204, April 2, 1974, Pat. No. 3,898,978. This application Mar. 31, 1975, Ser. No. 563,410

Int. Cl.² F28D *13/00*

U.S. Cl. 165—104 S **5 Claims**

1. A portable gas heating apparatus for attachment to a pressurized gas source to help maintain diver comfort in a cold aqueous environment by producing heated breathing gas, comprising:

a heat exchanger comprising metal tubing in an insulated walled chamber adapted to contain a hot liquid used to heat the breathing gas which circulates through said metal tubing;

a heated liquid at 124°–160° F in said chamber which is charged to said chamber just preceding a dive by the diver, said liquid selected from the group consisting of fresh water, seawater, glycerol, ethylene glycol and mixtures of glycerol or said glycol with water;

the volume of said liquid based upon the kind of breathing gas which is selected from the group consisting of air, oxygen, helium-air mixture and helium-oxygen mixture and delivering for every three pounds of heated fluid at 124° F a breathing temperature of between about 75° to 90° F for at least 90 minutes; and,

inlet and outlet tubes to supply compressed gas to the heater and lead heated breathing gas from said metal tubing from said heat exchanger to the diver.

4,014,385

PLATE HEAT EXCHANGERS

Felix William Wright, Copthorne Bank, near Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

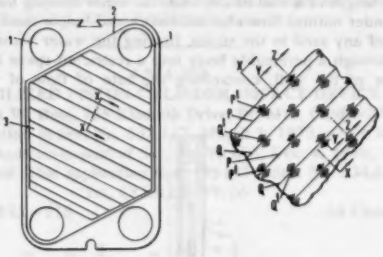
Filed May 21, 1975, Ser. No. 579,451

Claims priority, application United Kingdom, May 24, 1974, 23405/74

Int. Cl.² F28F *3/08*

U.S. Cl. 165—167 **3 Claims**

1. A plate heat exchanger comprising a pack of plates arranged in spaced, face-to-face relationship, the said plates each including a principal heat exchange zone, a pattern of corrugations in the heat exchange zone, the said pattern of corrugations crossing and abutting with the corresponding pattern of corrugations on an adjacent plate to provide interplate support and turbulance in liquid flowing in a flow space formed by said plates, in which the corrugations are locally increased in stiffness at longitudinally spaced locations along the corrugations and on at least one of said plates at the points of abutment with an adjacent plate by varying the cross-sec-



tion to sharpen the curvature of the corrugations at these locations.

4,014,386

SUBSURFACE SAFETY VALVE APPARATUS

Joseph L. Johnson, Houston, and Shelby L. Guidry, Conroe, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,619

Int. Cl.² E21B *43/12*

U.S. Cl. 166—321 **17 Claims**

1. Valve apparatus adapted for use in a production conduit of a well, comprising: a valve body having a flow passage, valve means movable between open and closed positions with respect to said flow passage; control means including a dome charged with a selected amount of pressure that tends to cause said valve means to move to said closed position; and hydraulic means responsive to the pressure of a control fluid and to the pressure of fluids flowing in said conduit for preventing closing of said valve means.

4,014,387

APPARATUS AND PROCESS FOR DRAWING WATER FROM A WATER-BEARING STRATA

Leonhard Fink, Frankfurt, Germany, assignor to Thyssen Plastik Anger KG, Munich, Germany

Filed Jan. 10, 1975, Ser. No. 540,002

Claims priority, application Germany, Jan. 11, 1974, 2401327

Int. Cl.² E03B *3/18*; E21B *43/08*

U.S. Cl. 166—314 **10 Claims**

1. A process for drawing water free from sand from a well bored into a water-bearing strata and preventing water from

being drawn into a pump at high speed, the steps of flowing the water into the well from a water-bearing strata through a plurality of openings distributed over a surface of a predetermined length of a wall of the well, the water flowing into the well under natural flow characteristics and below the inertia force of any sand in the strata, flowing the water within the well through a permeable body into a restricted space in the interior of the well, controlling the rate of flow of water

through the permeable body such that the quantity of water flowing into the restricted space corresponds to the natural flow of water from the strata and to the pumping capacity of a pump connected to the permeable body such that the quantity of water to be pumped will flow into the restricted space without any force by the pump, and distributing the pump action of the water from the restricted space over the entire length of the permeable body and over the predetermined length of the perforated wall of the well.

4,014,388

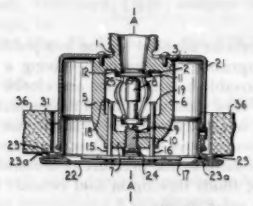
CONCEALED SPRINKLER ASSEMBLY

James R. Anderson, Berwyn, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed June 21, 1976, Ser. No. 698,479

Int. Cl.² A62C *37/12, 37/30*

U.S. Cl. 169—37 **12 Claims**



1. A sprinkler of the flush mounted type which comprises:
a. a sprinkler body having a nozzle therein,
b. a bracket attached to the sprinkler body,
c. an outer cover plate attached to the bracket by means of a bonding material having a relatively low softenpoint,
d. a deflector which rests against the cover in a normally retracted position and which is also positioned to intercept and divert a stream of liquid discharged from the nozzle, the deflector being slidable away from the nozzle with respect to the discharge axis thereof, and
e. urging means whereby said deflector is continuously pressed against the cover for aiding the detachment thereof from the bracket upon softening of the bonding material, and whereby the deflector is slid into an operating position upon detachment of the cover.

4,014,389

ENDLESS BALLAST CONVEYOR CHAIN

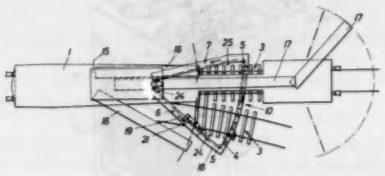
Josef Theurer, Vienna, and Karl Folser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed July 21, 1975, Ser. No. 597,414

Claims priority, application Austria, Aug. 14, 1974, 6688/74

Int. Cl.² E01B *27/00*

U.S. Cl. 171—16 **11 Claims**



1. A track working machine comprising a frame, an endless conveyor chain mounted on the frame, the chain including a first stringer arranged to extend transversely of the track and therebelow, and two stringers arranged laterally of the machine frame and extending from respective ends of the first stringer, guide rollers mounted at the ends for guiding the stringers in a polygonal path, and a chain tensioning device including a chain guide assembly comprising a first, transverse chain guide on which the first stringer is mounted and two longitudinally extending chain guides rising from the transverse chain guide on which the laterally arranged stringers are mounted, at least one of the chain guides comprising an upper and a lower part movable in relation to each other in the direction of chain elongation, a drive for moving the two chain guide parts in relation to each other to adjust the effective length of the one chain guide and thus effectively to shorten or lengthen the effective circumference of the chain guide assembly for tensioning or loosening the endless chain mounted thereon, and means for pivoting the longitudinally extending chain guides with respect to the machine frame.

4,014,390

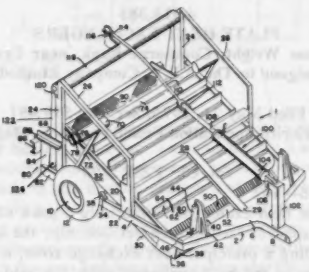
BEACH CLEANER APPARATUS

Antone S. Teixeira, 4050-F Keanu St., Honolulu, Hawaii 96816

Filed Feb. 13, 1974, Ser. No. 442,193

Int. Cl.² A01D *17/00*

U.S. Cl. 171—124 **26 Claims**



1. A beach cleaner apparatus comprising
a wide vehicular chassis for moving across a surface of sand,
a wide continuous conveyor, attached to the vehicular chassis and extending across the chassis, for carrying sand

and debris removed from a surface of sand along a conveyor run in the vehicular chassis,

a sifting deck having lateral beams attached to the vehicular chassis and lying below the prescribed path through which the sand and debris are carried by the continuous conveyor, which sifting deck is formed with a plurality of apertures of sufficient dimensions to permit grains of sand to fall through to the beach and of sufficient dimension to block the passage of debris; and

a sand lifting blade, attached to a lower end of the sifting deck and extending forward beyond the conveyor, which sand lifting blade extends downward from the vehicular chassis into the sand at an oblique angle with respect to the surface of the sand such that a lifting edge of the sand lifting blade is pointed in a direction of forward motion of the vehicular chassis;

a transverse medial pivot rod connected to pillow blocks on the dependent chassis and to lugs on lateral beams of the sifting deck for pivoting the sifting deck and the attached lifting blade from front to rear at an approximate central area of the deck, and hydraulic actuators connected between the sand lifting edge and the chassis to raise and lower the sand lifting edge to adjust a depth of entry of the cutting edge into a surface of sand;

whereby, a thin layer of sand and debris is shaved from the surface of the sand by the sand lifting blade; and whereby, debris is separated from the sand by the subsurface sand lifting blade; and whereby, debris is separated from the sand by the sifting deck over which the sand and debris are drawn by the continuous conveyor, the sand being returned to the beach, and the debris being collected.

4,014,391

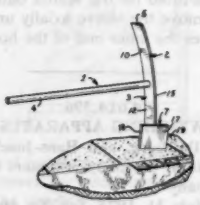
COMBINATION DIGGER, TRIMMER, AND EDGER TOOL

Olin P. McWhirter, P.O. Box No. 5, Greenville, Tex. 75401

Filed Jan. 2, 1976, Ser. No. 646,360

Int. Cl.² A01B *1/20;* **A01G** *3/06*

U.S. Cl. 172—13 **8 Claims**



7. A combination digger, trimmer, and edger tool comprising:

a. an elongated handle member having opposite end portions;

b. a blade member mounted on one end portion of said handle member, said blade member having a first portion extending laterally from said one end portion of said handle member and having a free end with a cutting edge thereon, said blade member having a second portion extending laterally from said one end portion of said handle member and having a free end with a cutting edge thereon, said second portion being in opposed relation with said first portion of said blade member, said second portion of said blade member having opposite side edges and a first surface and a second surface, one of said side edges of said second portion of said blade member having a recess therein; and

c. a side blade member mounted on and extending laterally from said blade member and having a cutting edge thereon for cutting vegetation, said side blade member being received in said recess in said one side edge of said blade member second portion, said side blade member having one surface thereof flush with the one side edge of said second portion of said blade member, said side blade member having opposite ends, said side blade member having at least one of said opposite ends thereof spaced from a respective one of said first and second surfaces of said second portion of said blade member.

4,014,392

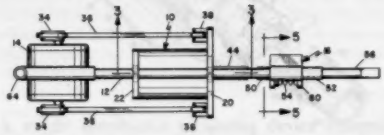
STABILIZED PISTON-CYLINDER IMPACT DEVICE

Frederick W. Ross, 755 Klamath Drive, Del Mar, Calif. 92014

Continuation of Ser. No. 337,127, March 1, 1973, which is a continuation-in-part of Ser. No. 95,008, Dec. 4, 1970, abandoned. This application Dec. 19, 1974, Ser. No. 534,626

Int. Cl.² B25D *11/16*

U.S. Cl. 173—118 **34 Claims**



1. An impact device comprising:

a frame,

a crankshaft rotatably mounted on said frame,

exciter means operatively mounted to rotate said crankshaft,

a body mounted for reciprocation along a selected straight path on said frame,

at least two connecting rods operatively connected to said crankshaft in a spaced relation for actuation thereby in substantially the same rotational phase and operatively connected to reciprocate said body along said selected path upon rotation of said crankshaft,

ram means mounted on said body and free for reciprocation relative thereto substantially parallel to reciprocation of the body,

resilient means interposed between said body and said rams means for converting reciprocating motion of said body to impacting motion of said ram means,

impact tool means operatively mounted on said frame for impact by said ram means during each reciprocation thereof,

reciprocative guide means operatively interposed between said frame and said body and comprising a body guide element and a frame guide element and guiding said body in substantially linear reciprocation along said selected path substantially free of extraneous rotations from torques imposed on the body by angular thrust of the connecting rods,

said body guide element operatively engages the frame guide element at least at one point closer to the axis of said crankshaft than the location with respect to said crankshaft of the end of said at least two connecting rods which is more remote from said axis with said end in the most remote position from said axis during operation.

4,014,393

CORE RECEIVER AND METHOD OF USE THEREOF

Wilber M. Hensel, Jr., Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Jan. 8, 1976, Ser. No. 647,476

Int. Cl.² E21B *25/00, 49/02*

U.S. Cl. 175—58 **14 Claims**

8. A method of collecting a core sample from a core barrel suspended above a drilling rig floor in generally vertical positioning, said method comprising:

supporting the core sample in the core barrel with a slidable bulkhead positioned in the end thereof;

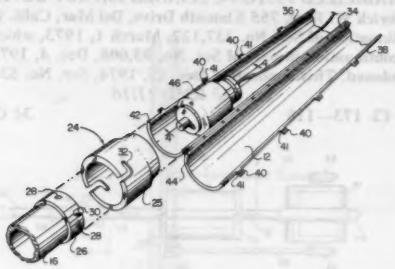
coupling a core receptacle beneath the barrel in general vertical alignment therewith for receiving the core sample therefrom;

allowing the bulkhead to emerge into and downwardly through the core receptacle; and

disengaging the receptacle from the barrel for removal of the core sample therefrom.

12. Apparatus for collecting a generally vertically positioned columnar mass from a containment barrel positioned therearound, comprising:

a tubular housing;



means adapting said tubular housing for coupling to the lower end of the containment barrel and receiving the contents thereof;

a slidable bulkhead adapted for positioning within said housing and the barrel for the underlying support of the mass therein; and

means for controlling the position of said bulkhead in the barrel and said housing and the rate of axial movement therein for controlling the receipt of the columnar mass from the barrel into said housing.

4,014,394

RESTORING LOST CIRCULATION

Daniel F. Bailey, Midland, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 19, 1975, Ser. No. 579,120

Int. Cl.² C09K *7/02;* **E21B** *33/138*

U.S. Cl. 175—72 **9 Claims**

1. A method for decreasing the permeability of a zone of lost circulation located in a formation penetrated by a well bore, which method comprises introducing into said well and into said zone an aqueous slurry having a pH no greater than about 9.6 and comprising bentonite suspended in sufficient water to render said slurry initially pumpable and a small amount of magnesium oxide, within the range of from 0.37 to 10 weight percent based on the weight of said bentonite, which is sufficient to cause controlled gelation of said slurry to a set gel after placement thereof in said zone.

4,014,395

ROCK DRILL BIT INSERT RETAINING SLEEVE ASSEMBLY

Bernard A. Pearson, Bothell, Wash., assignor to Smith-Williston, Inc., Seattle, Wash.

Continuation of Ser. No. 530,019, Dec. 5, 1974, abandoned, which is a continuation of Ser. No. 303,334, Nov. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,695, March 8, 1972, abandoned. This application Oct. 14, 1975, Ser. No. 621,751

Int. Cl.² E21C *13/08*

U.S. Cl. 175—410 **2 Claims**

1. A button and sleeve assembly adapted for use in a cylindrical hole in a drilling head, said hole having a cylindrical side wall of given diameter and having a given depth from an open outer end to an inner end, said assembly comprising,

a continuous hollow elastic metal sleeve having an inner tapered surface and an exterior cylindrical surface extending between axial inner and outer ends spaced apart by a length as great as said given depth, the diameter of said exterior surface when the sleeve is relaxed being slightly less by a uniform first amount than said given diameter,

and a solid button mated with the sleeve and having an outer tapered surface extending between axial inner and outer ends spaced apart by a length exceeding said length of the sleeve,

said inner surface of the sleeve and outer surface of the button having matching tapers sloping outwardly to their said inner ends from their said outer ends, said matching tapers being of uniformly diminishing diameters with the uniformly diminishing diameter of the button being greater than the relaxed uniformly diminishing diameter of the sleeve by a uniform second amount which is slightly

greater than said first amount whereby a force fit will be provided between the sleeve and the cylindrical side wall of a said hole when the button is centered and seated with its inner ends against the inner end of the hole and the sleeve is then press-fitted its entire length onto the button, the metal material of said sleeve and said first and second amounts being such that the sleeve is adapted to enter well into a said hole without engaging the side wall of the hole as a consequence of radial stretching of the sleeve over the seated button exceeding said first amount and the elastic limit of the sleeve will not then be exceeded and plastic deformation will not then occur when the sleeve is press-fitted on the seated button to the extent necessary to move the sleeve axially until the inner end thereof reaches the inner end of the hole.

4,014,396

WEIGHING APPARATUS

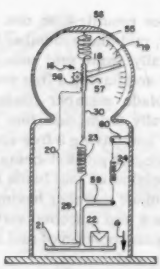
Ernst Lohmann, Duisburg, and Hans-Joachim Sacht, Duisburg-Rahm, both of Germany, assignors to Berkel GmbH, Duisburg, Germany

Filed July 31, 1975, Ser. No. 600,899

Claims priority, application Germany, Aug. 1, 1974, 2437058

Int. Cl.² G01G *23/14, 23/26*

U.S. Cl. 177—169 **23 Claims**



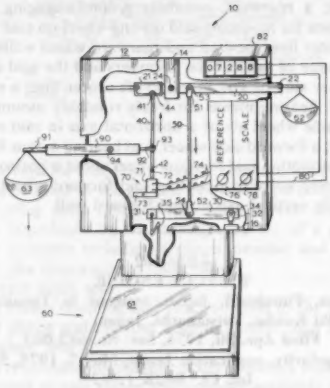
1. In a weighing scale with a movement and indication assembly having a movement means to measure a load and an indication means to indicate the weight of the load, wherein the movement means exhibits hysteresis between weighing

operations with increasing and decreasing loads, a weighing platform, a bar linkage mechanism connected between the movement means and weighing platform, and counterforce means connected to the bar linkage mechanism, the improvement in the bar linkage mechanism which includes an extension means between the connection to the counterforce means and the connection to the movement means which increases the path difference of the hysteresis effect, and said extension means having a direction of elongation opposed to the force of the counterforce means.

4,014,397
ELECTRICAL COUNTING SCALE

Donald R. Langevin, 3117 SE. 19th Ave., Cape Coral, Fla. 33904

Filed May 7, 1976, Ser. No. 684,151
Int. Cl.² G01G *19/00*
U.S. Cl. 177—200 **14 Claims**

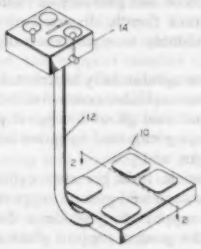


1. An electrical counting scale comprising in combination:
a sample receiver for receiving an unknown number of pieces of like weight;
a first commodity receiver for receiving therein an unknown number of said pieces to be counted representative of a primary load force;
a first lever pivotted about a first fulcrum for coupling in a first fixed ratio said sample receiver to said first commodity receiver;
load transducer means coupled to said first lever for generating a load signal representative of a load force transmitted thereto responsive to a rotation of said first lever about said first fulcrum;
load indicating means electrically coupled to said load transducer for receiving said load signal and displaying a representation thereof;
load reduction means coupled between said commodity receiver and said first lever for reducing in a fixed second ratio said primary load force transmitted therebetween;
said load reduction means comprises:
a second lever pivotably coupled about a second fulcrum and having said first commodity receiver attached thereto; and
means for coupling said second lever to said first lever for producing a rotation of said first lever about said first fulcrum responsive to said reduced primary load force therebetween.

4,014,398
WEIGHT DISTRIBUTION MEASURING INSTRUMENTS

William Gresko, 17837 107th Ave., Sun City, Ariz. 85351

Filed July 7, 1975, Ser. No. 593,429
Int. Cl.² G01G *5/04;* **A61B** *5/10*
U.S. Cl. 177—208 **3 Claims**

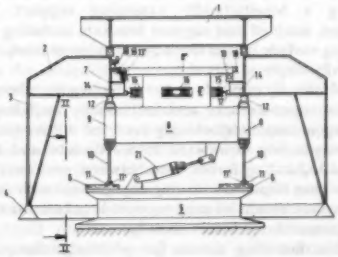


1. A weight distribution measuring device comprising a base, first and second pairs of foot pads mounted on said base, adjustable means for horizontally positioning the first pair of foot pads with respect to said second pair of foot pads on said base, weight responsive means operatively connected to each of the food pads for independently measuring the amount of weight present on each of the foot pads, and metering means for presenting simultaneously the amount of weight present on each of the foot pads, the first pair of foot pads being in fixed position with respect to the base and the second pair of foot pads being mounted on the base for forward and rearward movement with respect to the first pair of pads, each of the pads being operatively disposed on the piston of a hydraulic cylinder, which said cylinder is hydraulically connected through locking means to a gage mounted on a display panel and calibrated to give a direct read-out of the weight presented to the respective pad, and the locking means including a four way hydraulic control valve adapted for establishing hydraulic communication between the cylinder of each pad and the respective gage when the control valve is in the "open" position and for retaining the reading presented to each gage when the control valve is in the closed position.

4,014,399
MOUNT FOR HEAVY SERVO MECHANISMS

Joachim Ruder, Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed Oct. 20, 1975, Ser. No. 623,796
Int. Cl.² B62D *57/02*
U.S. Cl. 180—8 C **7 Claims**



1. A mounting providing linear and rotary feed for heavy duty equipment, characterized by
a. an annular main support;
b. a secondary support rotatably disposed on said main support and coaxial therewith;
c. a plurality of vertical reversible fluid pressure cylinders

each having a cylinder head and piston rod end fixedly disposed on said secondary support and spaced circumferentially therearound;

d. a ground support plate;

e. the cylinder heads of said plurality of cylinders resting against said annular main support;

f. swingable slide blocks connected to the end of each piston rod of each of said plurality of fluid pressure cylinders;

g. a guide track fixedly disposed on said ground support plate for slidably receiving each of said piston rod slide blocks;

h. at least one substantially horizontal secondary reversible fluid pressure cylinder connected between said secondary support and said ground support plate, said secondary cylinder being mounted to move in the direction of said guide tracks; and

i. said reversible fluid pressure cylinders being interconnected between said ground support plate and said annular main support to provide a direct vertical support between the ground support plate and the annular main support.

4,014,400

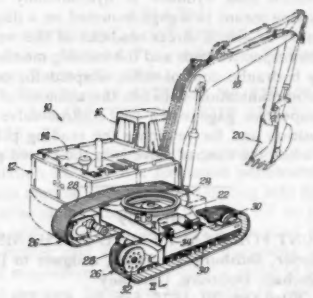
MOUNTING ARRANGEMENT FOR DETACHABLY COUPLING A VEHICLE FRAME TO A GROUND-ENGAGING UNDERCARRIAGE

Lawrence R. Cline, Oswego, and Theodore B. Hogg, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1975, Ser. No. 643,457

Int. Cl.² B62D *55/00*

U.S. Cl. 180—9.2 R **9 Claims**



1. A mounting arrangement for supporting a vehicle superstructure comprising;

a pair of laterally opposite track roller frames individually having a longitudinally extending support bracket thereon, each of said support brackets including upright bearing surface means thereon and a lower hook laterally inwardly disposed thereon;

a pair of laterally opposite frame mounting members on the vehicle superstructure and individually including lower bearing means interlockingly received within said hooks for transferring downward forces thereto and resisting lateral separating forces therebetween, and bearing surface means disposed in facing engagement with said bearing surface means of said support brackets for transferring lateral thrust forces therebetween;

removable fastening means for positively clamping said bearing surface means of said track roller frames and frame mounting members together; and

laterally interengaging projection and recess means on said frame mounting members and said support brackets for interlockingly resisting longitudinal shear forces therebetween while permitting free vertical movement therebetween.

4,014,401

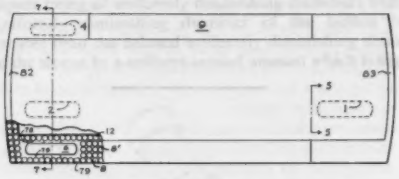
LOW-COST, RUGGEDLY SIMPLE, OVERTURN-PREVENTING VEHICLE

Alvin Edward Moore, Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 462,734, April 22, 1974, Pat. No. 3,944,008. This application July 7, 1975, Ser. No. 593,716

Int. Cl.² B62D *61/12*

U.S. Cl. 180—22 **11 Claims**



1. A land vehicle comprising: a framework including a floor, front, rear and side walls; buffer means extending along the outside of said side walls, said buffer means comprising a plurality of rows of tubular members, and means for covering and holding said tubular members together; a forward, normally ground-engaging steerable wheel, means mounting said steerable wheel on one side of a fore-and-aft center line of said framework; a rearward, normally ground-engaging, driving wheel; means for mounting said driving wheel on said one side of said center line; forward and rearward wheel wells formed between some of said tubular members and the said side wall on the other side of said fore-and-aft center line; a rearward side wheel; bearing means for freely rotatably mounting said rearward side wheel about a horizontal axis in said rearward wheel well; a forward side wheel; and bearing means for freely rotatably mounting said forward wheel about a horizontal axis and for freely swivelly mounting said forward wheel about a substantially vertical axis in said forward well.

4,014,402

BICYCLE ENGINE

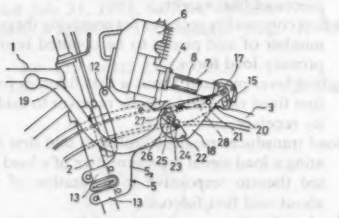
Goro Muto, Funabashi, Japan, assignor to Tanaka Kogyo Kabushiki Kaisha, Yatsumachi, Japan

Filed Apr. 30, 1976, Ser. No. 682,063

Claims priority, application Japan, May 2, 1975, 50-58939

Int. Cl.² B62K *11/12*

U.S. Cl. 180—33 D **16 Claims**



1. A bicycle engine arrangement comprising:

a forwardly extending drive shaft (**8**) driven by said engine (**6**);

a transmission roller (**9**) at the end of said forwardly extending shaft (**8**) and having an axis of rotation substantially perpendicular to the rotation axis of said driving shaft;

an engine frame (**5**) including means for fixedly mounting same to a bicycle;

means (**12**) for pivotally mounting said engine (**6**) to said frame (**5**) such that said engine may be inclined freely relative to said engine frame (**5**); and

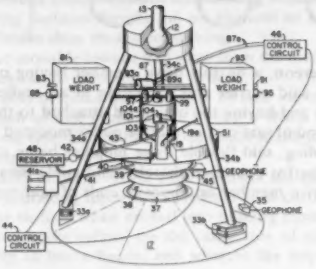
a lever means (**18,19**) turnably coupled to said engine

frame (5), said lever means including an operating member (18) pivotally connected to said engine and said operating member (18) being further coupled to said transmission roller (9) via a pin (17) such that upon turning movement of said lever means relative to said engine frame said engine is selectively inclined to selectively engage said transmission roller with a tire of the bicycle.

4,014,403
VIBRATORY APPARATUS FOR USE IN SEISMIC EXPLORATION

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 415,095, Nov. 12, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,918
Int. Cl.² G01V *1/04*
U.S. Cl. 181—114 **15 Claims**



1. In a variable frequency seismic vibrator wherein seismic energy is coupled to the ground by means of a coupling plate, said coupling plate being reciprocably driven relative to a reaction impedance by the driving member of a piston and cylinder assembly including a piston member and a cylinder member, the improvement comprising:

a reaction mass; and

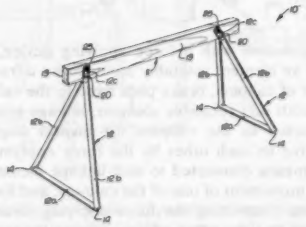
spring means coupling said reaction mass to the member of said piston and cylinder assembly other than the driving member; and

means responsive to changes in the vibratory motion of said member of said piston and cylinder assembly other than the driving member for varying the stiffness of said spring means so as to maintain said vibratory motion substantially at a minimum.

4,014,404
SAW HORSE

Edgar D. Jackson, Alta Loma, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed Sept. 10, 1975, Ser. No. 612,044
Int. Cl.² F16M *1/00*
U.S. Cl. 182—155 **1 Claim**



1. A saw horse construction comprising

a. a horizontally elongated and relatively narrow work beam, and

b. first and second like support members for the beam,

c. each support member comprising elongated tubing defining a transverse base and two legs extending upwardly from the base, the legs having upper end portions with pivotal first connection to the work beam to accommodate pivoting of the support member relative to the beam and bringing the base into adjacency to the beam,

d. said base and legs of each support member having triangular configuration, said support member comprising only a Δ shaped single and continuous elongated metallic tube defining folded bends between said base and legs, said leg upper end portions defined by flattened upper terminals of the tubing which engage and guide against the beam opposite sides during said pivoting, the support members having collapsed positions relative to the beam and in which their bases extend, respectively closely above and closely below the beam, said flattened upper end portions extending substantially entirely adjacent the beam sides in said collapsed positions of the support members,

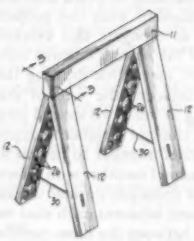
e. said leg flattened upper end portions of each support member also having releasable second connection with the beam to block said pivoting and to retain the support member extending downwardly and longitudinally relative to the beam in beam supporting position, each releasable second connection defined by a removable fastener extending transversely through the beam and through said flattened upper terminals and proximate the pivotal connection of the member to the beam, said second connection spaced from the first connection in the general direction of elongation of the associated leg,

f. said first and second connections being the only connections of the legs to the beam.

4,014,405
KNOCK-DOWN SAWHORSE

John H. Breisch, 2103 Arthur Ave., Lakewood, Ohio 44107

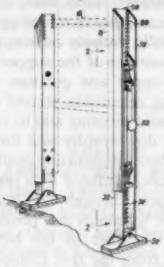
Filed June 30, 1975, Ser. No. 591,429
Int. Cl.² F16M *1/00*
U.S. Cl. 182—181 **2 Claims**



1. A sawhorse comprising a horizontal, hollow cross beam open at the underside thereof having a plurality of spaced laterally-extending partitions which define a plurality of rectangular-shaped vertical recesses; and at least two pairs of hollow legs, each leg having a wedge-shaped upper portion with a flat vertical side and a flat, non-parallel, angled side, the width of said vertical side and said angled side being essentially the same as the spacing between said partitions, said vertical sides being hollow and provided with a vertical integrally-formed reinforcing strut forming a bearing surface thereon, each leg also having a lower portion extending at an obtuse angle from said upper portion, said lower portion also being hollow from its inner side and provided with a plurality of integrally-formed diagonal reinforcing struts, each pair of legs being removably secured to said beam by juxtaposing said vertical sides of said pair of legs and inserting said upper ends of said pair of legs together into one of said recesses, the maximum thickness of said juxtaposed pair of upper ends

being slightly greater than the corresponding interior width of the recess, whereby said upper portions form a wedging engagement with said recess; said cross beam and said legs formed of structural foam polypropylene having a specific gravity of between 0.68 and 0.72, a compressive strength of between 1,400 and 1,600 psi, a tensile strength of between 1,800 and 2,000 psi, and a flexural modulus of 95,000 to 105,000 psi.

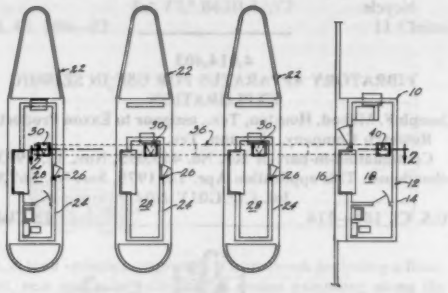
4,014,406
LADDER LEVELING DEVICE
James Fred Easton, 19 John St., Wellsville, N.Y. 14895
Filed May 13, 1976, Ser. No. 685,736
Int. Cl.² E06C *7/44*
U.S. Cl. 182—204 **1 Claim**



1. A ladder leveling device for extending a leg of a ladder having elongate side legs joined by spaced cross pieces, said leveling device comprising a first U-shaped channel member having side walls normal to an elongate web mounted on one of said legs, a longitudinal series of projections integral with said channel and extending inward from the web thereof, a second U-shaped channel member sized to fit in the first channel member and form a telescopic extension therefor, a longitudinal series of projections integral with the second channel member extending outward from the web thereof into intermeshing relationship with the projections of the first channel member, an elongate slot extending longitudinally through the web of the second channel member adjacent the projections thereon, means for drawing the web of the first channel member adjacent the web of the second channel member comprising at least two spaced projections affixed to the web of the first channel member to extend through the slot of the second channel member to permit longitudinal movement of the first channel member with reference to the second channel member, a cross-pin normal to said stud, oppositely inclined wedge means adjacent each stud means, means movable into the space between the cross-members and the web of the second channel to forcibly move the projections of the second channel into a state of interference with the projections of the first channel, and lever means connected to spaced wedge means requiring a single movement to simultaneously move the wedges oppositely to clamp the channel members together at a plurality of points.

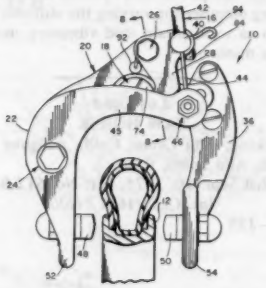
4,014,407
CONCEALED SECURITY TRANSPORT SYSTEM
Perry J. Painter, Mabelton, Ga., assignor to The Citizens and Southern National Bank, Atlanta, Ga.
Filed July 7, 1975, Ser. No. 593,435
Int. Cl.² E04H *3/04*
U.S. Cl. 186—1 C **9 Claims**

1. In a concealed security transport system for drive-in banks or the like which have remote cashiers windows: a main building and a plurality of remote stations spaced substantially in a row from said main building, a concealed passage extending substantially in a horizontal elongated straight line from said main building beneath the floor thereof across and beneath the surface in each of said remote stations, an access door in said main building and said remote stations, an open money and valuables carrier container supported for movement in said passage, and having support wheels on opposite sides thereof, elongated straight rails having said support



wheels thereon, a flexible drive member having one end attached to said carrier and extending in an endless manner therefrom and having the other end attached to the opposite and rear end of said carrier, a drive pulley mounted within said main building, said flexible drive member being around said drive pulley for operation thereby, and guide means for said flexible drive member on opposite ends of said passage.

4,014,408
VARIABLE-LEVERAGE BRAKES FOR BICYCLES
Allen E. Armstrong, 34 Robinson Road, Lexington, Mass. 02173
Filed Aug. 7, 1975, Ser. No. 602,668
Int. Cl.² B62L *1/16*
U.S. Cl. 188—24 **15 Claims**

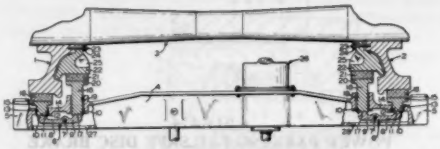


1. In combination with a force applying device, a brake assembly for an element rotatably mounted on a frame, comprising a pair of calipers, brake pads fixed to the calipers and engageable with said rotatable element, linkage means separately connected to the calipers for pivotal displacement thereof relative to each other by the force applying device, guide track means connected to said linkage means for slidably guiding movement of one of the calipers, and force transmitting means connecting the force applying device to the linkage means and the other of the calipers for sequentially displacing the calipers relative to the element at different leverage ratios.

4,014,409
MULTI-BRAKE SHOE MEANS FOR A MULTI-BRAKING SURFACE BRAKED ASSEMBLY

Andrew G. Haydu, Swisshelm Park, and Robert B. Morris, North Huntingdon, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 17, 1975, Ser. No. 587,861
Int. Cl.² F16D *49/16*
U.S. Cl. 188—58 **4 Claims**



1. Multi-brake shoe means for transmitting braking force to multi-braking surfaces formed on an element to be braked, said multi-brake shoe means comprising:

a. a member movable toward and away from the multi-braking surfaces on the element to be braked,

b. a plurality of brake heads carried by said movable member, each of said brake heads having a shank extending from one side thereof the end of which shank is provided with a concave surface.

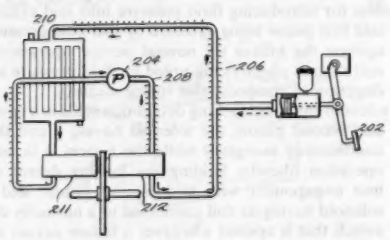
c. a plurality of brake shoes, each having a braking face via which a braking force is transmitted to a corresponding braking surface when moved into braking contact therewith and being carried on the other side of one of said plurality of brake heads, and wherein the improvement comprises:

d. a pair of levers, each of which is so pivotally mounted intermediate its ends on said movable member as to form two arms, the end of each arm being provided with an arcuate surface for sliding abutting contact with the concave surface on the end of the shank of a corresponding one of said plurality of brake heads whereby the braking face of the brake shoe carried by each brake head is maintained in contact with its corresponding braking surface without tilting with respect thereto notwithstanding the rate of wear of any one of said plurality of brake shoes exceeding that of another.

4,014,410
DISC BRAKE WITH FLUID COOLED ACTUATOR

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Continuation-in-part of Ser. Nos. 361,633, May 18, 1973, abandoned, Ser. No. 416,010, Nov. 15, 1973, Pat. No. 3,918,558, and Ser. No. 503,151, Sept. 4, 1974, Pat. No. 3,983,966. This application Sept. 26, 1975, Ser. No. 617,151
Int. Cl.² F16D *65/84*
U.S. Cl. 188—71.6 **3 Claims**

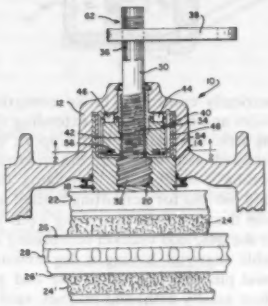


1. A friction disc brake apparatus comprising in combination a rotating member, a disc immovably mounted on said rotating member, said disc being adapted to rotate when said member rotates, a plurality of piston-cylinder means opposite each other on opposite sides of said disc, a friction pad fixed to the end of each of said pistons, fluid circuit means interconnecting said piston-cylinder means series with each other and a master cylinder, heat radiation means mounted in series with said circuit means, a pump mounted in series with said fluid circuit means external to said rotating member adapted to continuously pump fluid through said unit and heat radiation means thereby cooling the fluid contained within said circuit means, and brake pedal means connected to a piston mounted in said master cylinder adapted to expell fluid from said master cylinder into said fluid circuit causing the friction pads of the pistons to engage said disc.

4,014,411
MECHANICALLY ACTUATED DISC BRAKE WITH SELF ADJUSTING FEATURE

Thomas F. Troester, Dayton, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,095
Int. Cl.² F16D *55/02, 65/56*
U.S. Cl. 188—71.9 **10 Claims**



1. In a mechanically actuated disc brake assembly including means for pressing a brake pad against a face of a brake disc, power threads carried by said pressing means, an actuating shaft rotatable about the longitudinal axis thereof, and power threads on a first section of said shaft complementary to and in engagement with said pressing means power threads, whereby braking rotational movement of said shaft about said axis thereof with said shaft restrained against axial movement away from said pressing means will cause said pressing means to press a brake pad against a face of brake disc, the improvement comprising:

a. means defining a fine thread on a second section of said shaft,

b. an actuating nut,

c. means defining a fine thread on said nut complementary to and in engagement with said fine threads on said second section of said shaft,

d. means defining a recess within which said nut is received,

e. cooperating ratchet means on opposing portions of said nut and a wall of said recess,

f. frictional forces due to friction between contacting surfaces of said nut and said second section of said shaft being greater than frictional forces between contacting surfaces of said nut and portions of said assembly other than said shaft, and

g. said ratchet means permitting unlimited rotational movement of said nut in unison with said shaft during said braking rotational movement of said shaft but limiting the degree of rotational movement of said nut with said shaft during retracting rotational movement of said shaft,

h. whereby said nut will rotate with said shaft except as limited by said ratchet means and said ratchet means may limit rotation of said adjuster nut with said shaft during retracting rotational movement thereof to cause relative

rotational movement between said nut and said shaft to advance said shaft toward a face of a brake disc with which said shaft is associated.

4,014,412

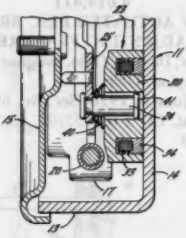
ELECTRICALLY CONTROLLED BRAKE WITH IMPROVED ANTI-ROTATION BRACKET FOR MAGNET

David L. Swanson, Rockford, Ill. and Robert C. Walter, South Bend, Ind., assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 17, 1976, Ser. No. 658,376

Int. Cl.² B60T 7/12

U.S. Cl. 188—138 **8 Claims**



1. An electrically controlled brake comprising a support having two sides and having a hole extending therethrough, a pin projecting from one side of said support, and an electromagnet telescoped with said pin, the improvement in said brake comprising a bracket for restricting rotation of said magnet on said pin and for permitting limited axial floating of the magnet on the pin while restricting axial removal of the magnet from the pin, said bracket comprising a strip of resiliently yieldable material having a leg extending generally parallel to said pin and secured at one end portion to said magnet to float axially with said magnet, said leg having an opposite end portion projecting slidably through said hole to restrict rotation of said magnet on said pin, and a tang integral with and extending substantially perpendicular to said opposite end portion of said leg and engageable with the other side of said support to restrict axial removal of said magnet from said pin.

4,014,413

BRAKES FOR VEHICLES

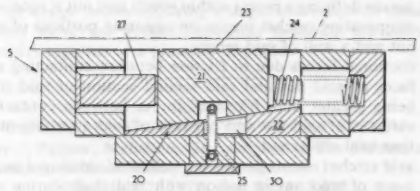
Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed May 16, 1975, Ser. No. 578,028

Claims priority, application United Kingdom, June 21, 1974, 27729/74

Int. Cl.² B60T 13/10

U.S. Cl. 188—170 **15 Claims**



1. Brake equipment for a vehicle which is in use moves along a path adjacent to an anchored rail, comprising a number of co-acting brake elements slidable along the rail, resilient means for urging at least one of the brake elements into contact with the rail and fluid actuated means for urging the said brake element out of braking contact with the rail, at least one of the brake elements including a wedge assembly having a brake pad which upon contacting the rail is urged by relative movement of wedge components in the wedge assembly to increase the braking force of the brake equipment on the rail, wherein the brake equipment comprises a first relatively moveable jaw and a second relatively fixed jaw for contacting the rail, and wherein the relatively fixed jaw includes the wedge assembly and wherein the first and second jaws are mounted on opposite sides of the rail.

4,014,414

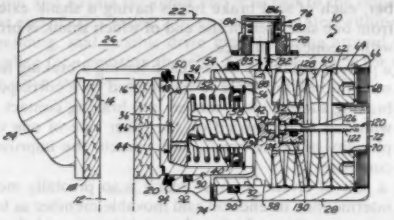
POWER PARKING FAILSAFE DISC BRAKE

Mayjue A. Yamamoto, 3235 N. "F" St., San Bernardino, Calif. 92405, and Daniel G. Durfee, 5051 Crescent St., San Bernardino, Calif. 92407

Filed July 7, 1975, Ser. No. 593,770

Int. Cl.² F16D 65/20

U.S. Cl. 188—170 **7 Claims**



1. A power parking, failsafe disc brake for an automotive vehicle comprising, in combination:

a rotatable disc having friction faces on opposite sides thereof, a pair of friction pads engaging respective friction faces, and a caliper housing operably connected to each of said friction pads for urging the same into braking engagement with said disc when the brake is actuated, said caliper housing having a pair of axially aligned cylinder bores provided therein;

a first piston slidably disposed within one of said cylinder bores and having an end portion bearing against the adjacent friction pad;

a second piston slidably disposed within the other cylinder bore;

clearance adjusting means having a screw thread connection to said second piston and a frictional clutch connection with said first piston, and including a spring acting to extend said adjusting means;

compression spring means bearing against one side of said second piston in the direction to apply the brakes;

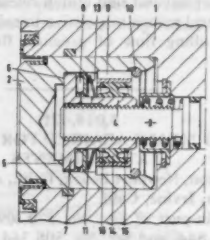
means for introducing fluid pressure into said cylinders, said first piston being actuated by said fluid pressure to operate the brakes for normal service operation and said second piston being urged by fluid pressure in the direction to compress said spring means;

a solenoid-operated locking detent that seats in a cavity in said second piston, the solenoid having a coil that is continuously energized while the system is in normal operation, thereby holding the locking detent down into engagement with said second piston; and said solenoid having its coil connected to a normally closed switch that is opened whenever a failure occurs in the normal service hydraulic brake system, whereby the solenoid is de-energized to release said second piston and allow said compression spring means to apply the brakes automatically responsive to failure of the service brakes.

4,014,415
ADJUSTING DEVICE FOR HYDRAULIC WORKING PISTONS

Hajo Pickel, Hachenburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sept. 10, 1975, Ser. No. 612,063
Int. Cl.² F16D 65/38
U.S. Cl. 188—196 D 5 Claims

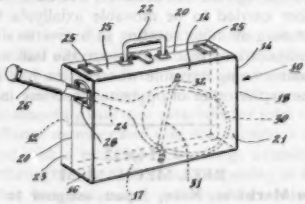


1. An automatic adjusting device for a hydraulic working piston comprising:
a threaded spindle;
an adjusting nut threaded on said spindle to limit the return movement of said working piston;
a frictional-engagement turning mechanism in association with said nut, the operation of said turning mechanism being dependent on the stroke of said working piston;
a resilient connection between said turning mechanism and said working piston; and
a brake associated with said nut to prevent a turning movement thereof, the operation of said brake being dependent on a predetermined hydraulic pressure actuating said working piston, said brake including
a sealing arrangement having two seal lips extending in opposite directions with respect to each other, said sealing arrangement being stationarily connected to said working piston and said seal lips abutting against said adjusting nut in a sealed friction torque relationship in the presence of said predetermined hydraulic pressure;
said sealing arrangement including
a single seal having said seal lips sealed against said adjusting nut; and
said single seal is disposed in a gear sleeve connected to said working piston by a disengageable circlip remote from said working piston.

4,014,416
ATTACHE CASES

Harold Golden, 107 3616 Barham Blvd., Los Angeles, Calif. 90068

Filed Jan. 20, 1976, Ser. No. 650,625
Int. Cl.² A45C 3/00
U.S. Cl. 190—42 10 Claims

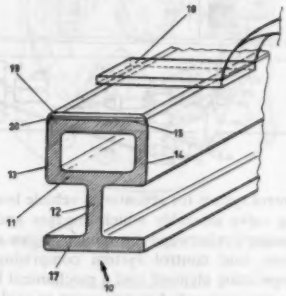


1. An attache case having an aperture extending through and substantially totally surrounded by an uninterrupted portion of the top region of one of its end panels, and means inside said case which is integral with said end panel and is moveable into and out of a position of closure of said aperture.

4,014,417
CONDUCTOR RAIL

Tibor Kugler, Thayngen, and Hans Wolfhart Rieger, Beringen, both of Switzerland, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Division of Ser. No. 275,519, July 27, 1972, Pat. No. 3,873,577. This application Aug. 7, 1974, Ser. No. 495,435
Claims priority, application Switzerland, July 29, 1971, 11215/71; Germany, Sept. 22, 1971, 2147410
Int. Cl.² B32B 15/18
U.S. Cl. 191—29 DM 2 Claims

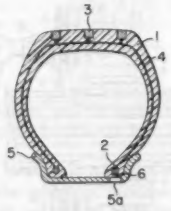


1. A conductor rail comprising a load-bearing body of aluminum or an aluminum alloy, and a preformed layer of steel having a thickness of at least 0.3 millimeter metallically united to said body on the part of the rail to which electrical contact is to be made during use thereof, said metal uniting establishing electric conductivity between said layer and body.

4,014,418
TIRE WITH EMBEDDED CURRENT COLLECTOR

Ryo Ikeda; Toshihiko Hori, both of Hiratsuka, and Susumu Nakamura, Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,494
Claims priority, application Japan, Sept. 11, 1973, 48-101690; Aug. 19, 1974, 49-94863
Int. Cl.² B60L 5/38
U.S. Cl. 191—45 R 2 Claims



1. A current-collecting and power transmitting elastic tire for a vehicle comprising a non-pneumatic tire made of elastomer and being of toroidal shape in radial section and including a tire body, a plurality of electrodes of conductive material embedded in the tire body and extending in the circumferential direction of the tire tread portion, said electrodes being exposed at one end thereof from the tire tread surface and being electrically connected at the other end thereof to electrical wiring extending to a radially inner portion of the tire for connection to a suitable portion of the vehicle, said electrodes being suitably grouped and adapted to be electrically connected to the vehicle by said electrical wiring so as to constitute at least two separate current transmitting circuits, each of which includes a flexible annular conductive band extending

circumferentially of the tire and positioned in the tire tread portion.

4,014,419

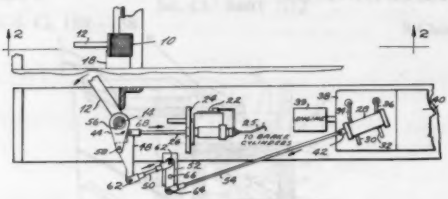
SEQUENTIAL OPERATOR FOR CLUTCH AND BRAKE

Jimmy McKnight, Wadley, Ga., assignor to Fulghum Industries, Inc., Wadley, Ga.

Filed Aug. 30, 1973, Ser. No. 393,225

Int. Cl.² B60K *29/00*

U.S. Cl. 192—13 R **2 Claims**



2. A control system for actuating a vehicle brake system and an inching valve assembly which engages and disengages a driving connection between the vehicle engine and the vehicle transmission, said control system comprising an operator actuated operating element and a mechanical linkage including a ratio arm connected at one point to said operating element so that initial movement of the latter applies a force to said ratio arm; said ratio arm being connected at a second point to said inching valve assembly and connected at a third point to said brake system for applying braking force upon initial movement of said operating element and responsive to the resistance to the application of further braking force to operate said inching valve in a mode to disengage said driving connection and thereafter apply further braking force.

4,014,420

BRAKED AUTOMOTIVE FRICTION CLUTCH

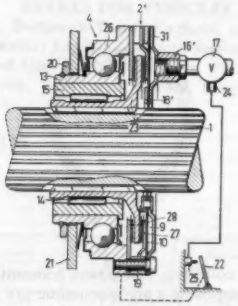
Hans-Walter Riese, Dittelbrunn, Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed Nov. 24, 1975, Ser. No. 634,837

Claims priority, application Germany, Dec. 16, 1974, 2459403

Int. Cl.² F16D *67/04*

U.S. Cl. 192—13 R **5 Claims**



1. A braked clutch arrangement comprising:

a. a support including a housing;

b. a clutch shaft rotatable relative to said support about an axis;

c. a brake member enveloped by said housing and axially movable on said shaft in angularly secured relationship;

d. a friction member secured on said support in said housing against rotation about said axis;

e. pressure-fluid operated moving means for moving said brake member into engagement with said friction member,

1. said moving means including a pressure member axially movable in said housing in angularly secured relationship and engageable with said brake member for pressing the brake member axially against said friction member;

f. clutch release means for releasing said shaft from a driven clutch portion, said clutch release means including a clutch control member mounted for movement between an inoperative position and a clutch releasing position, and further beyond said clutch releasing position; and

g. fluid control means responsive to said further movement for controlling flow of pressure fluid to said moving means.

4,014,421

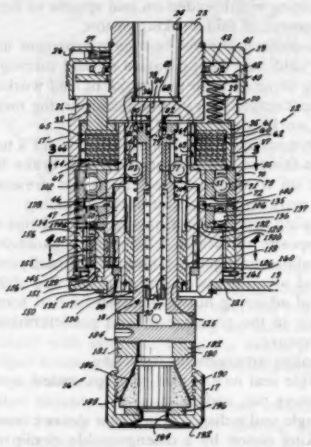
CLUTCHING MEANS ADAPTED FOR USE IN TAPPING ATTACHMENTS

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 520,409, Nov. 4, 1974, Pat. No. 3,946,844, and Ser. No. 508,344, Sept. 23, 1974, abandoned. This application July 28, 1975, Ser. No. 599,783

Int. Cl.² F16D *11/00, 21/06*

U.S. Cl. 192—48.91 **13 Claims**



1. In coupling means for transmitting torque in combination of first rotating member, a second axially aligned rotating member, said members being relatively movable axially, means for transmitting rotary drive from one member to another, said means including at least one ball member positioned between the members, and both members having configurations engageable with the ball member whereby drive is transmitted through the ball member, a circular holder for the ball member carried to be movable axially, a third axially aligned rotating member rotating in a reverse direction and having configurations that can engage the ball member, said circular holder being movable whereby the ball member can engage one or the other of oppositely rotating members.

4,014,422

REEL MECHANISM

Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Nov. 7, 1975, Ser. No. 629,829

Claims priority, application Japan, Nov. 7, 1974, 49-135401[U]; Nov. 7, 1974, 49-135402[U]

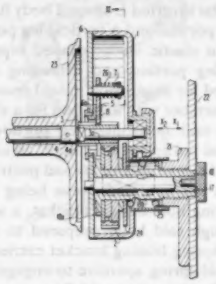
Int. Cl.² F16D *11/10;* **A01K** *89/015*

U.S. Cl. 192—67 R **6 Claims**

1. In a reel mechanism, a clutch apparatus for selectively

engaging and disengaging a pinion and a main rod in an axial direction, whereby said pinion and rod are locked to rotate simultaneously in the engaged position and are free to rotate separately when in the disengaged position, said reel mechanism being the type having a housing and handle for imparting rotation to said pinion via a main toothed wheel, said clutch apparatus comprising:

a. spring biased clutch lever means for imparting axial motion to said pinion, said clutch lever means being engaged with said pinion to permit relative rotation therebetween and having paired arms extending radially from opposite



sides of said pinion, said clutch lever means being connected to said housing to prevent rotational movement thereof and permit axial movement thereof,

b. cam means, positioned in said housing, and having at least a cam surface acting on each arm of said clutch lever means, for imparting an axial force to said clutch lever means when said cam means is rotated from a first position to a second position in opposition to said bias, and

c. switching lever means for rotating said cam means from said first position to said second position to force said clutch and said pinion to move axially whereby said pinion is disengaged from said rod.

4,014,423

CLUTCH PLATE FOR A FRICTION CLUTCH

Karl-Heinz Werner; Gerhard Baron, and Kurt Fädler, all of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed July 30, 1973, Ser. No. 383,615

Claims priority, application Germany, Aug. 4, 1972, 2238947

Int. Cl.[2] F16D *3/14, 47/02*

U.S. Cl. 192—106.2 **4 Claims**

1. A clutch plate for a friction clutch comprising:

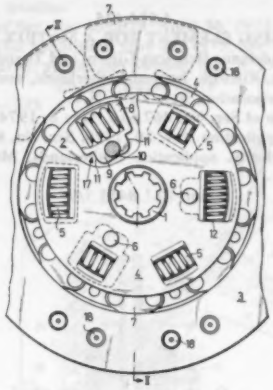
a. a hub unit including a tubular hub member having an axis, and a flange member projecting from said hub member in a radially outward direction and fixedly fastened to said hub member;

b. a disc unit including a first radial disc member and a second radial disc member coaxially rotatable relative to said hub unit and offset from said flange member in opposite axial directions, and a plurality of spacer members axially connecting said disc members for joint movement,

1. said flange member and said disc members being each formed with a plurality of openings extending axially therethrough, a portion of each opening in said flange member being circumferentially coextensive with respective openings in said disc members and constituting a set of three openings with the circumferentially coextensive openings in said disc members; and

c. a helical compression spring simultaneously received in the three openings of each set, and extending tangentially relative to a circle about said axis,

1. said spacer members passing through respective openings in said flange member in radially outwardly offset



relationship to the springs received in the same openings.

4,014,424

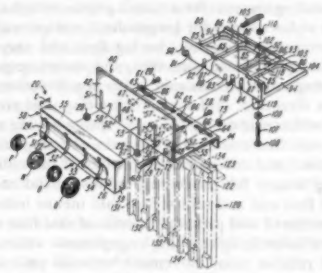
DEVICE FOR TESTING THE FLATNESS, SIZE AND SHAPE OF COIN-TOKENS

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed June 9, 1975, Ser. No. 584,773

Int. Cl.[2] G07F *3/02*

U.S. Cl. 194—102 **19 Claims**



1. A device for testing coin-tokens for flatness, diameter, thickness and roundness, and for advancing, turning, and then depositing acceptable coin-tokens into a discharge aperture comprising:

a. an upstanding first member having a substantially vertical elongate slot therethrough, dimensioned to accept coin-tokens which do not exceed a predetermined standard of flatness, diameter and thickness;

b. a second member projecting at substantial right angles from said first member and having a support surface over which a coin-token introduced through said slot is gravitationally advanced on-edge and having a substantially horizontal coin-token receptive discharge aperture therethrough at a location remote from said first member and lying in a plane angularly disposed relative to the slot;

c. a third member disposed above and in spaced, substantially parallel relationship with said second member, wherein said third member includes means engageable by the upper peripheral-adjacent edge of an acceptable on-edge coin-token supported on the second member for guiding it toward and then turning it relative to and in vertical alignment with said horizontal aperture; and

d. means mounting said third member for pivotal movement relative to said second member.

4,014,425
RECORDING ELEMENT FOR A MATRIX PRINTER

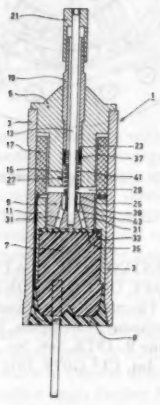
Wilhelmus Adrianus Henricus Gijzen, and Theodorus Gerhardus Potma, Rijswijk, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 467,616, May 6, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,579

Claims priority, application Netherlands, May 30, 1973, 7307525

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **4 Claims**



1. A recording element for a matrix printer which comprises a casing, a stylus carried for longitudinal motion with respect to said casing, a coil spring, having first and second ends, biasing said stylus in one direction, and means responsive to electric energization to bias said stylus in a direction opposite to said one direction, said spring being disposed around said stylus and within said casing, said coil spring having a plurality of turns at said first end disposed in axial abutting relationship in compressed and uncompressed modes of the entire spring and having means for preventing relative axial motion between said first end and said stylus, said means including the inside diameter of said plurality of coils of said first end being sized for sufficiently tight fitting engagement with said stylus to prevent relative axial movement between said stylus and said first end during operation of said recording element, said coil spring having an axial section intermediate said first end and said second end, said axial section having a plurality of coils disposed in axial spaced relation and having an inside diameter greater than the outside diameter of said stylus disposed within said axial section.

4,014,426
PAPER SUPPORT ROLL MECHANISM FOR USE IN A TELETYPEWRITER OR OTHER SUCH PRINTING DEVICE

Manfred Neufeld, Baierbrunn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 4, 1976, Ser. No. 663,741

Claims priority, application Germany, Mar. 20, 1975, 2512274

Int. Cl.² B41J *15/00*

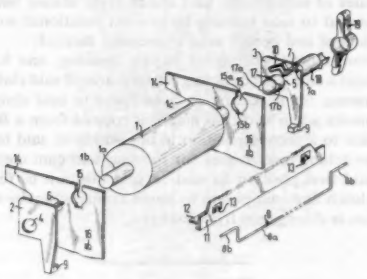
U.S. Cl. 197—133 R **3 Claims**

1. A paper support roll mechanism for use in and carried by a printing device such as a teletypewriter comprising:

a. a first and second vertical support member being separated to form a space therebetween, said members being carried by said printing device and having a respective first aperture respectively prepared to receive a locking sleeve in one of said apertures and a shaft in the other of said apertures, and a second respective aperture having a rectangular configuration and prepared to receive a bearing support bracket nipple,

b. a roll means comprising a solid elongated cylindrically-shaped roll and a shaft axially disposed and aligned with the longitudinal axis of said roll, and having end portions extending outwardly from said roll, said roll positioned between said support member with said shaft end portions being disposed in said first aperture respectively,

c. a first and a second bearing support bracket respectively comprising a flat inverted L-shaped body having an upper horizontal leg portion and a vertical leg portion connecting thereto, an elastic wedge-shaped nipple carried by said vertical leg portion and extending inwardly, said nipple prepared for disposition in said second aperture in said support member with a friction fit, a circular bearing hole through said horizontal leg portion prepared to support the end portion of said shaft, an elongated cylindrically shaped sleeve carried by and protruding inwardly from said first bracket, said sleeve being axially aligned with said bearing hole in said bracket, a second circular aperture through said body prepared to receive a wire spring, and a spring biasing bracket carried by said body adjacent to said spring aperture to engage said spring, said first bracket joined to said first support member by



the insertion of said sleeve into said first aperture in said support member and said nipple into said second aperture, to form a friction joint, and said second bracket joined to said second support member by the insertion of said nipple in said second aperture, said one end portion of said shaft disposed in said sleeve of said first bracket and said other end of said shaft inserted through said first aperture of said second support member and disposed in said bearing hole in said second bracket,

d. a cutting blade to maintain said paper in close contact with said roll comprising a flat elongated body having an upper horizontal cutting edge for cutting said paper, two offset spring retention tabs located adjacent to respective ends of said body, and an elongated reinforcing angle carried by said blade, said end portions of said blade being disposed in said blade retention bracket of said bearing support bracket respectively with a loose fit,

e. a pan-shaped blade spring comprising a wire formed having end portions aligned parallel to a middle portion, and intermediate portions joining with said end portion and middle portion at a right angle, said middle portion disposed in said offset tabs of said blade and said end portions disposed in said second aperture in said bearing support bracket respectively with a rotational fit, and said intermediate portions engaging said spring engagement brackets respectively,

wherein said blade is held against said roll by said spring to form a pressure joint between said roll and said blade.

4,014,427

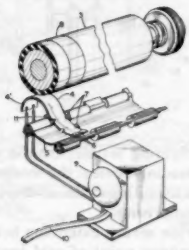
VARIABLE BOTTOM-EDGE MARGIN INDICATOR AND METHOD FOR TYPEWRITER PAPER AND THE LIKE

Carol M. Rines, 65 India Wharf, Boston, Mass. 02110

Continuation of Ser. No. 383,709, July 30, 1973, abandoned. This application July 15, 1975, Ser. No. 596,145

Int. Cl.[2] B41J *29/44*

U.S. Cl. 197—189 1 Claim



1. A variable bottom-edge margin indicator for typewriter paper and the like having, in combination with a typewriter of the type having a ball printing head, a cylindrical typewriter platen rotatable about its axis, immobile along its axis, and around the cylindrical surface of which the paper is advanced in a transverse path during typewriting, and a cylindrical-section paper shield beneath the platen; sensor means mounted beneath the platen inwardly of and adjacent to one end of the platen in the region of the paper shield and the path of advancement of the adjacent-side margin of the paper and disposed to receive said side margin of the paper between the sensor means and the platen at said region, said sensor means having means for discriminating between the presence and absence of said paper at said region and producing an electrical signal indicative of the advent of said absence corresponding to the advancement of the bottom edge of the side margin of the paper out of said region, said discriminating means comprising a pair of insulated electrical contacts closely separated at substantially the same circumferential region of said platen and cooperative with juxtaposed conductive band means circumferentially carried by the platen; indicator means connected to said sensor means and responsive to said signal and comprising audible signal means; means for adjusting the position of said sensor means transversely circumferentially about the platen correspondingly to vary the location of said region, said adjusting means comprising insulating band means carrying said contacts at its forward end, housing therein conductors for connecting said contacts to a power source, and adjustably disposed transversely within guide means provided under and adjacent said platen and upon said paper shield, said band means extending rearwardly of said paper shield to provide exposed tab means for enabling the circumferential adjustment of the band means within said guide means and along said paper shield and to provide an exposed region at which said conductors housed in said band means are connected to further conductors leading to said power source, and calibration setting means cooperative with said adjusting means and disposed external to said platen and sensor means to enable viewing of said calibration setting means by the operator for controlling the tab means of said adjusting means in order to vary the region, correspondingly to set different-dimensional desired bottom-edge margins of the paper.

4,014,428

MODULAR ARTICLE CONVEYOR

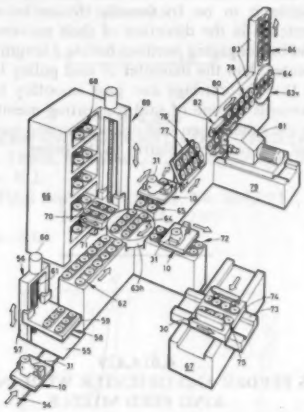
Carl Gilbert Richard Ossbahr, Risbrinksvagen 36, 58244 Linkoping, Sweden

Division of Ser. No. 465,629, April 30, 1974, Pat. No. 3,931,882. This application May 21, 1975, Ser. No. 579,613

Claims priority, application Sweden, May 4, 1973, 7306328

Int. Cl.[2] B65G *15/12*

U.S. Cl. 198—345 4 Claims



1. A conveyor system whereby an article can be transported along a defined path in which the article undergoes a change in the direction of its transporting movement, said conveyor system comprising:

A. a pair of supporting members, one which is movable in opposite directions relative to the other, each of said supporting members having thereon

1. a pair of elongated endless belt elements;

2. two pairs of pulley-like members, one pair for each of said belt elements and around which the belt element is trained;

3. means on each supporting member constraining its pulley-like members to rotate on spaced apart substantially parallel axes and fixing their locations in such relation to one another and to the supporting member that

a. each of said belt elements has straight inner and outer stretches extending lengthwise between its pulley-like members,

b. all portions of the two belt elements are disposed substantially in a single plane, and

c. at least one stretch of each belt element is parallel to its corresponding stretch of the other belt element and is laterally spaced a substantial distance therefrom; and

4. means for rotatably driving one of the pulley-like members of each of said pairs thereof, said means constraining said driven pulley-like members to rotate at substantially equal circumferential speeds but in opposite directions so that said parallel stretches of the two belt elements move lengthwise in the same direction;

B. means for moving said one supporting member to and from a position relative to the other at which said parallel stretches of the belt elements on the respective supporting members are in endwise adjacent lengthwise aligned relationship with one another; and

C. a carriage comprising

1. a carrier portion that is at least as wide as the distance between the inner stretches of laterally adjacent belt elements and which is substantially entirely spaced in one direction from said plane and has means thereon for carrying an article at its side remote from said plane, and

2. opposite elongated belt engaging portions on said carrier portion projecting therefrom in the direction toward said plane and across said plane and defining oppositely opening grooves in which said parallel stretches of the belt elements are receivable, said belt engaging portion being cooperable with one another and said parallel stretches of the belt elements to support the carrier portion in spaced relation to the belt elements, confine it against substantial motion in all directions transverse to said parallel stretches, and enable it to be frictionally driven by said parallel stretches in the direction of their movement, each of said belt engaging portions having a length substantially greater than the diameter of said pulley like members so that the carriage can pass smoothly from the belt elements on one of said supporting members to those on the other when said one supporting member is in its said one position relative to the other

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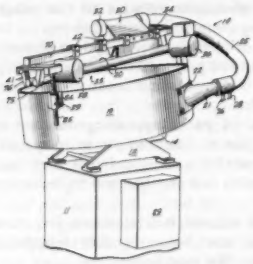
4,014,429

PARTS FEEDER AND ORIENTER WITH INDUCTION RING FEED NOZZLE

Irwin Walle, Clearwater, Fla., assignor to Tangen Drives, Inc., Clearwater, Fla.

Filed Nov. 17, 1975, Ser. No. 632,234
Int. Cl.² B65G 47/14
U.S. Cl. 198—396 **6 Claims**



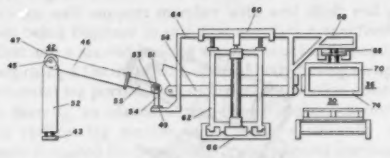
1. A parts feeder comprising, in combination:
delivery means for delivering parts in random fashion and unoriented with feed pressure to a pick up point,
means to said pick up point for directing said parts into an induction ring,
an induction ring having pneumatic means for accelerating and decelerating said parts in predetermined timed relationship to the passage therethrough,
said induction ring having a plurality of jets,
one area of said jets being directed forwardly for transport of the parts,
reverse jets being directed rearwardly for the unjamming of parts,
said jets being in spaced relationship to each other with the reverse jet being upstream of the flow, and the moving jet being downstream of the flow,
means for confining said parts and transferring the same to a location in spaced relationship with the induction ring,
means for transferring the parts from the confining means to orientation means for thereafter delivering the unoriented transported parts in oriented fashion for further processing.

4,014,430

AUTOMATIC PALLETIZER METHOD AND APPARATUS

Thomas Beaty, Jr., Northville; Asib S. Samander, Roseville, both of Mich., assignors to B & K Hydraulic Co., Livonia, Mich.

Division of Ser. No. 101,529, Dec. 28, 1970. This application May 30, 1972, Ser. No. 257,715
Int. Cl.² B65G 57/24
U.S. Cl. 198—588 **1 Claim**



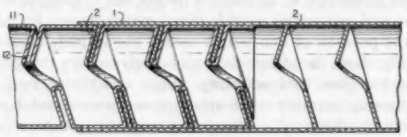
1. A system for delivering articles from a fixed area to a receiving point on a loading device, the loading device being of a type that is selectively movable in three perpendicular planes, said system comprising:
a telescoping conveyor means extending between the fixed area and the receiving point of said loading device for moving articles placed on the conveyor at the fixed area end to the receiving point of said loading device;
first means for mounting the fixed area end of said conveyor means for simultaneous pivotal movement about intersecting horizontal and vertical axes; and
second means for mounting the other end of said conveyor means to said loading device at said receiving point such that said other end of said conveyor means is movable with said receiving point as said loading device is selectively moved in said three perpendicular planes said other end of said conveyor means being pivotably mounted about intersecting horizontal and vertical axes at said receiving point;
whereby the articles conveyed by said system will be moved from said fixed area to said receiving point of said loading device irrespective of the position of said receiving point while said loading device is moved in said three perpendicular planes.

4,014,431

SPIRAL TUBE CONVEYOR

Eugene Angeletti, and Eugene Angeletti, Jr., both of R.D. No. 1, Marianna, Pa. 15345

Filed Aug. 29, 1975, Ser. No. 608,974
Int. Cl.² B65G 33/12
U.S. Cl. 198—660 **18 Claims**



1. An extendable and retractable conveyor system which comprises a main spiral-type tube conveyor which includes a cylindrical shell containing a screw element which is integral with the cylindrical shell and extends radially from said shell toward the center thereof and at least one additional spiral-type tube conveyor which includes a cylindrical shell containing a screw element which is integral with the cylindrical shell and extends radially from said shell toward the center thereof, said additional spiral-type tube conveyor being slightly smaller than the main spiral-type tube conveyor, one of said conveyors being provided with a male screw element and the other of said conveyors being provided with a female screw element, said male screw element being in screw engagement with said female screw element, whereby rotation of one cylindrical

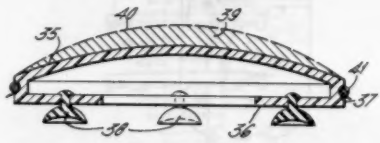
shell with respect to the other causes extension or retraction of the conveyor system.

4,014,432

PRODUCT FOR TREATING FABRIC

George Ernest Clothier, Clwyd, Wales; Robert Lewis Davies; John Albert Hockey, Wirral, England, and John Leonard Metcalfe, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,337
Claims priority, application United Kingdom, Apr. 9, 1975, 14533/75
Int. Cl.² B44D *1/46*
U.S. Cl. 206—0.5 12 Claims



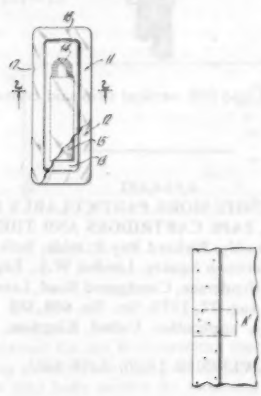
1. A product for the treatment of fabric in a tumble drier, comprising a perforated membrane pressure-generating means for exuding a conditioning agent through the perforations onto the surface of the product from which the conditioning agent can be removed by the fabric during use, said conditioning agent being normally solid but softenable upon application of heat during usage, and said membrane being heat shrinkable whereby to effect said pressure generation and exuding of the conditioning agent during use.

4,014,433

PACKAGE FOR MOISTURE SENSITIVE SUTURES AND METHOD FOR MAKING SAME

Robert J. Cerwin, Pittstown, N.J., assignor to Ethican, Inc., Somerville, N.J.

Filed May 27, 1975, Ser. No. 581,057
Int. Cl.² A61L *17/02*
U.S. Cl. 206—63.3 26 Claims



1. A substantially water vapor impervious package for moisture sensitive materials comprising two panels of a water vapor impermeable material coated on at least the edge margins of adjacent interior surfaces with a heat sealable polymer, said panels being joined through said edge margins about the periphery of said package by a continuous seal to enclose the moisture sensitive material within the central space of said package, said seal being characterized by having a square seal integrity of at least about 90 percent.

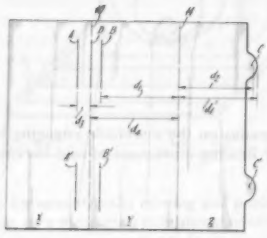
20. In a method for packaging moisture sensitive suture materials by enclosing said suture material in a hermetically sealed package formed by two panels of metal foil coated on at least the end margins of adjacent interior surfaces with a heat sealable polymer, said panels being joined through said heat sealable polymer in a continuous seal around the periphery of said panels to enclose the moisture sensitive suture material in the central space thereof, the improvement comprising increasing the storage stability of said suture material by sealing said package with a seal having a square seal integrity of at least about 90 percent.

4,014,434

FOLDERS AND INTEGRAL LOCK THEREFOR

Eberhard H. Thyen, Middlesex, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Sept. 3, 1975, Ser. No. 610,011
Int. Cl.² A61L *17/02*
U.S. Cl. 206—63.3 6 Claims



1. A folder of a stiff, foldable material comprising at least three adjacent panels foldably connected and including a center panel and two end panels, said end panels being folded inwardly over said center panel to provide an outer end panel partially overlapping an underlying end panel, and integral locking means for maintaining said panels in said folded construction, said locking means comprising a tab on the outer end panel extending beyond the edge of said panel, a locking slot in the underlying end panel underlying said tab and adapted to receive said tab, and a relief slot in the center panel substantially aligned with the tip of said tab whereby said tab may be forced to bypass the opposing edge of said locking slot and gain entry to said slot by displacing the edges of the locking slot and the relief slot in a direction normal to the plane of the folder.

4,014,435

COLLAPSIBLE RACK FOR SHIPPING AND/OR STORING GLASS SHEETS

James R. Rowley, Freeport, and Paul D. Majesky, Upper St. Clair, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 493,440, July 31, 1974, abandoned. This application May 12, 1975, Ser. No. 576,916
Int. Cl.² B65D *85/48*
U.S. Cl. 206—386 20 Claims

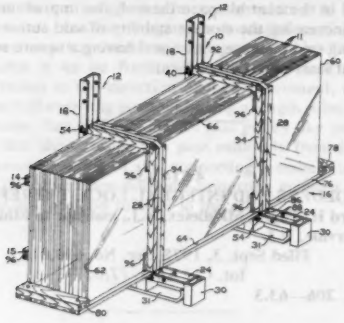
1. A collapsible rack for shipping and storing a plurality of flat sheets comprising:

at least two L-shaped supports made of a rigid material, each of said L-shaped supports comprising a vertical arm and a horizontal arm;

means for supporting said horizontal arm in spaced relation to a supporting surface; and

means detachably secured to said at least two L-shaped

supports for maintaining at least two L-shaped supports in spaced relation, said maintaining means including a base



having means on the underside engaging said horizontal arms for limiting movement of said horizontal arms.

4,014,436

DISPLAY CONTAINER FOR FOLDED BELT-LIKE OBJECTS

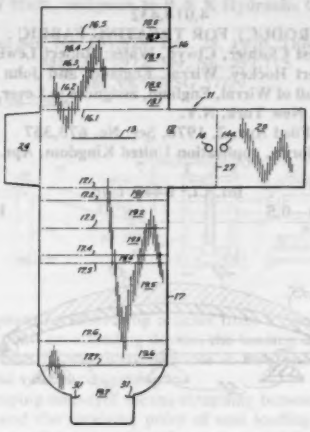
Philip Tunis, Port Chester, N.Y., assignor to Ben Tunis Company, Inc., Rye, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,824

Int. Cl.² B65D *85/54*

U.S. Cl. 206—492 **7 Claims**

1. Point-of-purchase display container for a folded belt-like object having front and back walls and a pair of sidewalls, said object having a principal fold dividing same into first and second segments and said container being so shaped that it can be fashioned from a single flat blank, said container back wall comprising a first vertical section having two vertical sides, a top edge and one of said container side walls comprising and a bottom edge, a first horizontal section extending outwardly essentially at right angles from one of said vertical sides, said first horizontal section having five vertical scores thereon to facilitate folding, the first of said scores being the junction of said first horizontal section and one of said vertical sides of said first vertical section, said five score marks dividing said first horizontal section into five vertical strips, and, numbering said strips outwardly from said first vertical section, on folding said first horizontal section, said first vertical strip forms a first side wall of a first compartment, said second and third vertical strips form a first flap inside said container, said fourth vertical strip forms a first side wall of a second



compartment and said fifth vertical strip said container front wall.

4,014,437

DISPLAY UNITS MORE PARTICULARLY FOR CASSETTES, TAPE CARTRIDGES AND THE LIKE

Clive St. John Rumble; Richard Roy Rumble, both of 47 Orchard Court, Portman Square, London W.1., England, and Patrick Joseph Henderson, Coastguard Road, Larne, Ireland

Filed Aug. 27, 1975, Ser. No. 608,385

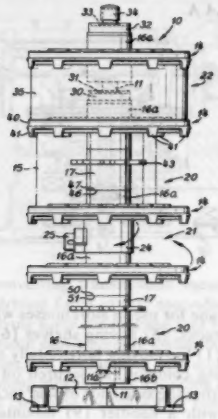
Claims priority, application United Kingdom, Aug. 30, 1974, 38032/74

Int. Cl.² E05B *73/00;* **A47F** *5/02*

U.S. Cl. 211—4 **9 Claims**

1. A display unit for cassettes and the like comprising a base, a spindle extending vertically from said base, a plurality of vertically stacked trays rotatably and axially movably mounted on said spindle, adjacent said trays cooperating to provide outwardly open receiver chambers for supporting cassettes, vertically directed flange means on said trays for blocking outward movement of said cassettes from said chambers in said stacked position of said trays, upper and lower fixed stop means on said spindle adjacent the uppermost and

lowermost of said stacked trays, respectively, for preventing spreading movement of said trays from said stacked condition, and spacer cam assembly means interposed between at least one adjacent pair of said trays, said cam assembly means including two relatively rotatable hub sections, said cam assembly means being shiftable between an axially elongated



locking position at a first relatively rotated position of said hub sections, and an axially foreshortened releasing position at a second relatively rotated position of said hub sections, and releasible locking means on said unit for selectively locking said sections against or releasing said sections for relative rotation to said second position.

4,014,438

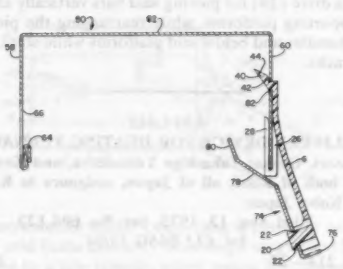
SPRING FASTENER

Jerome M. O'Toole, Shrewsbury, and Martin L. Haskins, Whitinsville, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Sept. 17, 1975, Ser. No. 614,000

Int. Cl.² A47F *7/00*

U.S. Cl. 211—13 **6 Claims**



1. A fastener for use in connecting together two members comprising a body section, a pair of spring clip means at one margin of said body section for mounting said fastener to a first member, a tongue extending away from said one margin beyond said spring clip means, said pair of spring clip means being located on each at opposite sides of said tongue, each of said spring clip means comprising a first leg that is co-planar with said tongue and a second leg with one end connected to said first leg and another end extending close to and resisting flexing away from said first leg, and a projection with oppositely directed lips at the outer end of said tongue for securing said tongue to a second member, said fastener being formed in one piece from a material which (a) is relatively stiff yet (b) has enough resiliency and flexibility to function as a spring member.

4,014,439

ECCENTRIC POSITIONING DEVICE FOR TOOLS AND WORKPIECES

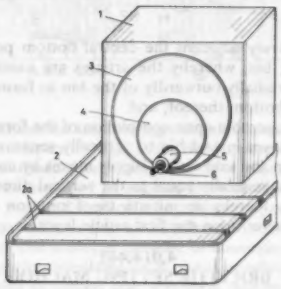
Adolf Kochsiek, Leopoldshohe, and Franz Wilhelm, Remscheid-Lennep, both of Germany, assignors to Wikotool-Systemtechnik Maschinenbau GmbH & Co. KG, Leopoldshohe, Germany

Filed Jan. 12, 1976, Ser. No. 648,110

Claims priority, application Germany, Jan. 10, 1975, 2500748

Int. Cl.² B65G *61/00*

U.S. Cl. 214—1 R **9 Claims**



1. A device for eccentrically moving and positioning a tool, or a workpiece, or a measuring instrument in connection with machining or measuring operations, for example, the device comprising in combination:

a stationary headstock, serving as a housing for the device;

an outer drum received inside a large bore in the headstock, in a rotatable bearing relationship therewith;

a smaller inner drum received inside a matching bore in the outer drum, in a rotatable bearing relationship therewith, the rotational axes of the outer and inner drum being arranged in parallel alignment, but eccentrically offset from one another by a first eccentricity;

a carrier member for said tool, workpiece, or measuring instrument received inside a matching bore in the inner drum in an axially movable relationship therewith, the rotational axis of the inner drum and the longitudinal axis of the carrier member being likewise arranged in parallel alignment, but eccentrically offset from one another by a second eccentricity;

means for rotating the outer drum in relation to the headstock;

means for rotating the inner drum in relation to the outer drum, so that the carrier member axis can be moved to any position within an annular positioning range whose small radius equals the difference between the two eccentricities and whose large radius equals their sum; and

means for axially moving the carrier member.

4,014,440

HIGH CAPACITY HARVESTING APPARATUS

William F. Millier, Ithaca; Gerald E. Rehkugler, Dryden; Roger A. Pellerin, Freeville, and James A. Throop, Brooktondale, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

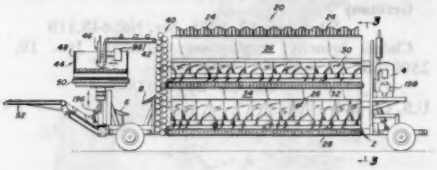
Filed Apr. 1, 1975, Ser. No. 564,149

Int. Cl.² B65G *57/18*

U.S. Cl. 214—6 H **21 Claims**

1. Apparatus for filling an open topped storage bin with generally spherical articles having generally the same dimensions comprising

a. a frame;
b. rotary platform means connected for vertical movement relative to said frame, said platform means being rotatable about its vertical axis and adapted to support said bin in a position in which the vertical axis of the bin is coincident with the vertical axis of said platform means;
c. means for rotating said platform about its vertical axis;
d. article supply means connected with said frame above said platform means for discharging the articles generally



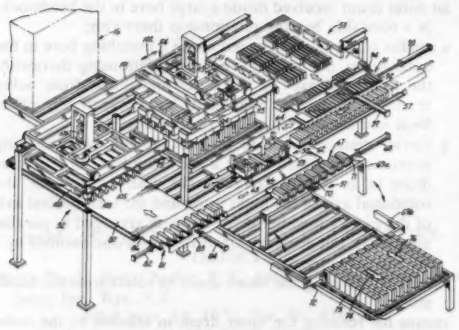
successively adjacent the central bottom portion of the rotating bin, whereby the articles are centrifugally displaced radially outwardly of the bin to form a first layer on the bottom thereof; and
e. means operable upon completion of the formation of the article layer in said bin to vertically separate said rotary platform and said article supply means by an incremental distance generally equal to the vertical dimension of the articles, thereby to initiate the formation of a second article layer upon the first article layer.

4,014,441

BRICK TIE SETTING MACHINE

William P. Osborn, Whittier, and Frank S. Pearne, Solano Beach, both of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

Filed May 14, 1975, Ser. No. 577,184
Int. Cl.² B65G *57/26*
U.S. Cl. 214—6 A **18 Claims**



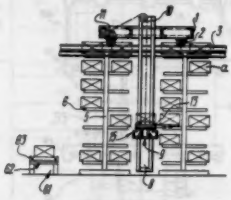
1. A machine for forming stacks of brick or the like having grids including intermixed first rows of lengthwise aligned brick and second rows of lengthwise aligned brick extending perpendicular to said first rows comprising first means for forming first patterns of first rows with longitudinal lanes between at least some of said first rows, second means for forming second patterns of said second rows with at least one lateral lane between the end faces of brick and said second rows, said first means operating to produce a plurality of different patterns which are combinable with related patterns formed by said second means to form grids including first and second rows, and transfer means operable to grip an entire pattern of rows along said lanes and to transfer and deposit such patterns at a stacking location, said transfer means thereafter operating to grip an entire related pattern of rows along its lane and to transfer and deposit such pattern in a prior pattern of rows with the lane thereof along one of the lanes of such prior pattern, without interfering with the brick in such prior pattern adjacent to said one of said lanes.

4,014,442

STACKER CRANE FOR STOREHOUSES

Jury Abramovich Adelson, prospekt Karla Marxa 21, kv. 57, and Oleg Antonovich Tamkovich, Moskovsky prospekt, 153, kv. 141, both of Leningrad, U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,386
Int. Cl.² B65G *47/00*
U.S. Cl. 214—16.4 A **2 Claims**



1. A stacker crane for use in storehouses where piece loads (*a*) are kept on racks, (5) having shelves (6) thereon, comprising: a frame (1) for moving horizontally across the racks; said frame carrying columns (8) secured on said frame at a certain distance from the side ends of said racks; said columns being provided with a handler (9) mounted thereon with provision for moving along them, and including a crosshead (12) located between said columns along the racks; said handler carrying a plurality of telescopic load-supporting platforms (13) arranged on said crosshead throughout its length at a certain distance from one another and interacting with the shelves in the course of load placing and removal; guides (16) positioned parallel to said crosshead and practically of the same length as said crosshead; and a device (15) for rearranging the piece loads on said handler, said device being provided with load-carrying elements (18) for receiving the piece loads from said load-supporting platforms, and installed movably with relation to said guides; wherein the latter are rigidly mounted to said crosshead, and said rearranging device includes a carriage (17) installed in said guides; said load-carrying elements being in the form of bars (18) arranged at the sides of said carriage parallel to said guides, below said load-supporting platforms, and being kinematically linked with said carriage by means of articulated link mechanisms (19) which include a drive (20) for moving said bars vertically above said load-supporting platforms, while rearranging the piece loads on said handler and below said platforms while stacking them on the racks.

4,014,443

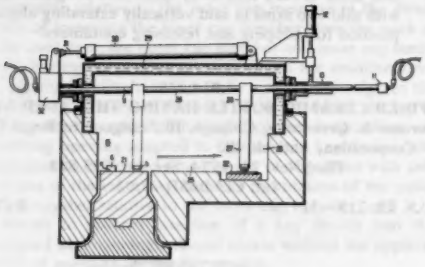
DELIVERY DEVICE FOR HEATING FURNACES

Akira Asari, Osaka; Takashige Yamamura, and Kenzou Tatsuno, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Aug. 13, 1975, Ser. No. 604,122
Int. Cl.² B65G *25/04*
U.S. Cl. 214—27 **11 Claims**

1. A device for delivering articles to be heated within a compound furnace which includes at least two furnace chambers wherein the articles are to be delivered from one furnace chamber to another furnace chamber, comprising:
clamping means being capable of, reciprocating within a delivery passage defined within said compound furnace, and, clamping and unclamping said articles to be heated;
running rod means, upon which said clamping means are fixed, movable along and within said delivery passage and having one end thereof projecting outwardly through a wall of said compound furnace;
primary drive means disposed exteriorly of said compound furnace and operatively connected to said one end of said running rod means for driving said running rod means and said clamping means;

secondary linear drive means also disposed exteriorly of said compound furnace and operatively connected to said one end of said running rod means for performing said clamping and unclamping operations of said clamping means;



movement converting transmission means for converting the linear driving force of said secondary drive means to a rotary driving force for rotating said running rod means so as to actuate said clamping means in order to perform said clamping and unclamping operations; and

clamp-positioning means for determining the stopping position of said clamping means within said passage.

4,014,444

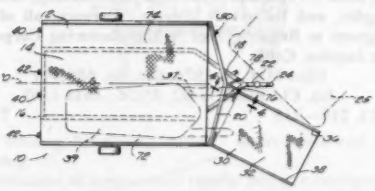
SNOWMOBILE TRAILER

Paul A. Jakel, Reeseville, Wis., assignor to Jakel Company, Inc., Reeseville, Wis.

Filed Sept. 11, 1975, Ser. No. 612,612

Int. Cl.² B65G *67/02*

U.S. Cl. 214—85 **4 Claims**



1. A snowmobile trailer comprising a platform and frame assembly said frame assembly including a tongue and hitch for connection to a tow vehicle, wheel means for supporting the frame and platform for travel along the ground, a loading and unloading ramp, and means for selectively connecting said ramp to the rear end of said platform and frame assembly for loading vehicles on said assembly and for connection to the forward end of said platform and frame assembly with the longitudinal centerline of said ramp at an angle extending away from the centerline of said platform and frame assembly to afford unloading of snowmobiles from the forward end of said assembly and with clearance with said tongue and including a deflector located above the platform of said trailer and forwardly of said platform, said deflector being oriented along a line parallel to the centerline of said ramp when said ramp is connected to the forward end of said platform and frame assembly to guide snowmobiles onto said ramp.

4,014,445

CATHODE PLATE TRANSFER APPARATUS

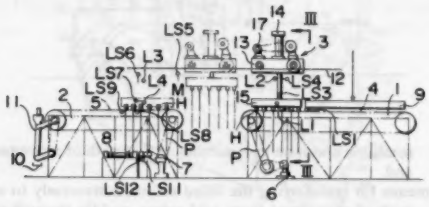
Toshinori Hirata, and Takahiro Kikkawa, both of Gifu, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 666,946

Claims priority, application Japan, Mar. 18, 1975, 50-32606; Mar. 18, 1975, 50-32607

Int. Cl.² B65G *47/52*

U.S. Cl. 214—89 **2 Claims**



1. An apparatus for transferring cathode plates, which comprises: a first conveyor which is for the purpose of conveying a bunch of cathode plates consisting of a plural number of cathode plates arranged at regular intervals upon receiving them on the rear end thereof; a second conveyor which is so disposed as to make its rear end confront the fore end of the first conveyor and is for the purpose of conveying said bunch of cathode plates consisting of a plural number of cathode plates arranged at regular intervals upon receipt thereof and sending them out one at a time from the fore end thereof; a shifting means which is devised to be capable of reciprocating between above the cathode plate discharging position in the fore end portion of the first conveyor and above the cathode plate supplying position in the rear end portion of the second conveyor and is equipped with a hanger provided on the lower part thereof thereby to hang up a bunch of cathode plates consisting of plural number of cathode plates arranged at regular intervals from said discharging position on the first conveyor and transfer them to said supplying position on the second conveyor; the first sensor which senses a receipt of a bunch of cathode plates by the first conveyor and actuates the first conveyor to advance said bunch of cathode plates up to the discharging position; a second sensor which senses the arrival of a bunch of cathode plates suspended by the hanger at the discharging position; a third sensor, which senses the passage of the rearmost cathode plate of the bunch of cathode plates through the discharging position and, during a time equivalent to the time required for the advance of said cathode plate by a prescribed distance from the supplying position, moves the shifting means to a position above the supplying position to see that the suspended bunch of cathode plates be put on the supplying position on the second conveyor in the arrangement that the foremost cathode plate is disposed at a prescribed distance behind the foregoing rearmost cathode plate, and also actuates the hanger; and a fourth sensor which senses the cathode plate whenever it is taken out of the fore end portion of the second conveyor one by one, and intermittently actuates the second conveyor at regular intervals.

4,014,446

PADDLE-TYPE LOADING MECHANISM FOR REFUSE TRANSPORT

Robert N. Stedman, Chillicothe, Ill., and Raymond L. Moser, Hot Springs, Ark., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 22, 1975, Ser. No. 624,793

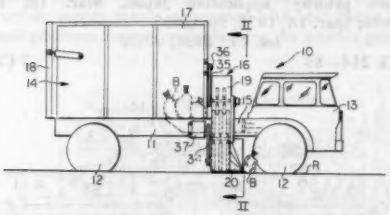
Int. Cl.² B65F *3/00*

U.S. Cl. 214—520 **11 Claims**

6. In a wheeled refuse transport vehicle having a hopper provided with a compaction chamber portion, the improvement comprising:

ramp means carried by said vehicle at one side thereof for picking up refuse adjacent the path of movement of the vehicle;

a rotary paddle mounted adjacent said ramp means for lifting refuse from said ramp means, said paddle being



rotatable about an axis parallel to said path of movement; and

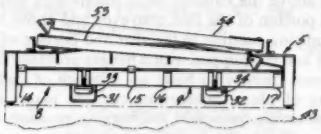
means for transferring the lifted refuse transversely to said path of movement from said rotary paddle through said inlet into said hopper.

4,014,447

GRAPPLER SPREADER WITH OVERHEAD GRAPPLING ARM STORAGE

Donald R. Whiteman, Medina, Ohio, and Dale H. Guthrie, High Point, N.C., assignors to RPC Corporation, Roxboro, N.C.

Filed Nov. 20, 1974, Ser. No. 525,399
Int. Cl.² B66F *9/18*
U.S. Cl. 214—620 **8 Claims**



1. A grappler spreader for handling cargo containers and piggyback trailers comprising:

a base frame arranged along a rectangle having horizontal, longitudinal and transverse axes or directions and comprising downward projecting latch means located immediately within each of four corners of said rectangle approximately outlining the outer extremities of the frame and projecting downwardly below any other portion of the spreader for detachably interlocking with a cargo container, said frame comprising rigid means at opposite ends thereof for transversely spacing said latch means;

four grappling arms and supporting means therefor, said supporting means being mounted atop said frame and extending transversely inwardly thereover, said supporting means for each of two arms at one side of said longitudinal axis comprising a first portion fixed to said base frame in transversely inserted relation to the periphery of said rectangle, and a second portion connected directly to the arm and movably connected with said first portion in guide relation therewith for movement relative to the first portion in a direction transversely of said base frame, said second portion comprising means rotatable relative to the first portion about a crosswise axis extending tranversely of the base frame through at least 90 degrees to enable rotation of the arm attached thereto from a vertically extending alignment position to an approximately horizontally extending alignment position generally parallel to said longitudinal axis above the base frame;

said second portion being laterally retractable on said first portion to dispose both of said two arms transversely inwardly within a vertical projection of said rectangle;

said two arms at said one side of said longitudinal axis being in overlapping relationship to one another in said horizontally extending alignment position;

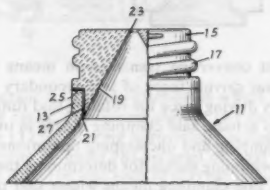
said supporting means for said two arms at said one side of said longitudinal axis including means for moving said two arms toward and away from said longitudinal axis with said two arms in said vertically extending alignment position for gripping and releasing containers.

4,014,448

FIRED CERAMIC BOTTLE HAVING THREADED NECK

Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.

Filed Nov. 21, 1974, Ser. No. 525,813
Int. Cl.² B65D *13/02*
U.S. Cl. 215—31 **8 Claims**



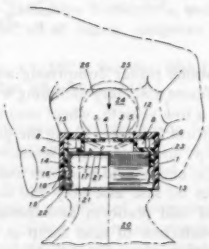
1. A fired ceramic bottle having a ceramic body portion with an opening therein, a ceramic adapter having an opening therein, said adapter having screw threads integral therewith on the outer surface thereof, said adapter being ceramically integrated with said body portion as a single unitary ceramic piece said adapter being so positioned with respect to said body as to provide closure of said bottle upon engagement of said threads by a threaded closure cap, said adapter having been separately formed from said body portion and then applied thereto and fired to integrate said adapter and said body portion ceramically into said unitary piece.

4,014,449

SAFETY CAP

John R. Hadley, San Rafael; Michel A. LeBrun, Jr., Sebastopol; John W. McRoskey; Leonard H. McRoskey, both of Los Angeles, and Delbert D. Swartz, Torrance, all of Calif., assignors to Republic Tool & Manufacturing Corporation, Los Angeles, Calif.

Filed May 14, 1976, Ser. No. 686,411
Int. Cl.² B65D *55/02, 85/56;* **A61I** *1/00*
U.S. Cl. 215—215 **7 Claims**



1. Safety closure for a container having an externally threaded neck comprising:

a. an inner cap member having a top portion and a cylindrical collar portion extending axially therefrom, said cylindrical collar portion having internal threads mating with the threads on the neck of the container, said top of the

inner cap member having a central longitudinal extending recess adapted to receive a key device;

b. an outer cap member having a top portion and a cylindrical collar portion extending axially therefrom, said collar portion fitting concentrically about said collar portion of the inner cap member, the outer cap member being freely rotatable relative to the inner cap member in the direction of loosening the inner cap member from the neck of the container, the outer cap member and inner cap member having cooperable locking means for unidirectional coupling for simultaneous rotary movement to tighten the inner cap member on the neck of the container, the top of the outer cap member having a central longitudinal extending opening adapted to receive said key device, and adapted to be moved into and out of alignment with said recess of the inner cap member by rotation of the outer cap member relative to the inner cap member, and

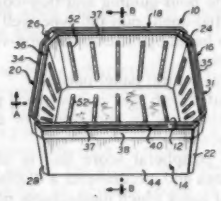
c. means to prevent insertion of a key device into the aligned said opening and said recess without the application of pressure on the key device.

4,014,450

PACKAGING CONTAINER

Floriano Girotti, Milan, and Mauro Gasparini, Segrate (Milan), both of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed Aug. 2, 1971, Ser. No. 168,313
Claims priority, application Italy, Aug. 10, 1970, 28464/70
Int. Cl.² B65D *43/06, 7/02*
U.S. Cl. 220—4 E **8 Claims**



1. A housing for storing items of desired size and shape comprising:

a. a container of symmetrical regular polygon configuration having a floor and side walls upstanding therefrom at all the same distance;

b. one group of alternate side walls including outwardly extending elongate grooveless flanges at the tops thereof including elongate fingers extending above the tops of said one group of walls along the entire width thereof; and

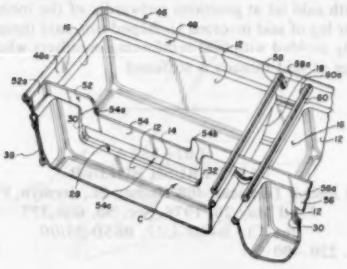
c. the other group of alternate side walls including outwardly extending elongate fingerless flanges at the tops thereof having elongate grooves therein complementary to said fingers and extending along the entire width of said walls of said other group for receiving said elongate fingers of said first group of walls, whereby two such housings may be brought together with their tops in confronting relation with one group of walls of one such housing in juxtaposition with the other group of walls of the other of such housings, and vice versa, to form a single closed container of about twice the volume of said housing.

4,014,451

BREAD PAN FOR BAKING MINIATURE LOAVES

Sidney E. Cannon; Billy M. Keith; Charles E. Cannon, and Joseph H. Caldwell, all of Dallas, Tex., assignors to Campbell Taggart, Inc., Dallas, Tex.

Filed Nov. 3, 1975, Ser. No. 628,394
Int. Cl.² B65D *85/00*
U.S. Cl. 220—20.5 **13 Claims**



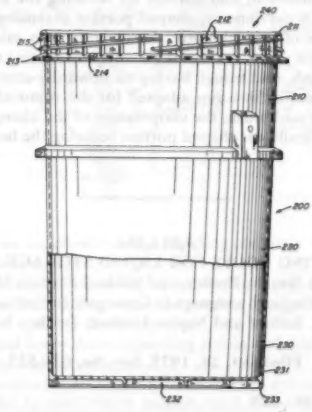
1. In a device for baking bread: a pan having end walls transversely disposed between sidewalls joined by a bottom; spaced divider walls each having a recess on the upper edge thereof, said divider walls being secured to the bottom and the sidewalls, dividing said pan into a plurality of sections; a top removably disposed on the pan; a plurality of spacers depending from the top, each spacer having a downwardly extending portion aligned with one of the divider walls and arranged to enter one of the recesses, said downwardly extending portions being spaced from the bottom of the recesses to form a passage between each section.

4,014,452

PLASTIC LIDS AND PAILS

Herbert W. Galer, Pine Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1975, Ser. No. 564,944
Int. Cl.² B65D *25/00*
U.S. Cl. 220—74 **5 Claims**



1. In a molded flexible thermoplastic open top pail having a top section, a middle section and a bottom section, said top section having engagement means for assembly with a lid having an inverted U-shaped rim portion that contains mating engagement means in the outer leg of said rim, said middle section being the predominant volumetric portion of said pail, the improvement comprising a top section with a plurality of integrally molded reinforcement members disposed about the

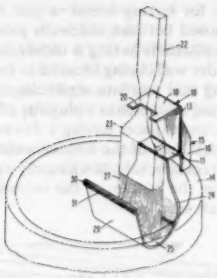
circumference of said pail, said members projecting outwardly from the sidewall of said pail and extending downwardly from the open end of said pail a distance sufficient to transfer vertical deflection to said middle section, the number of said members and the width to depth ratio of said members being sufficient to stiffen said top section without a material increase in the mass of said top section and wherein said engagement means are in the form of screw threads, said threads extending outwardly from the sidewall of said top section for engagement with said lid at positions outwardly of the inner face of the outer leg of said inverted U-shaped rim, said threads being integrally molded with said reinforcing members whereby the free edge of said threads is stiffened.

4,014,453

PAINT BRUSH HOLDER

Edward Joseph Tarnacki, 408 Hudson St., Jermyn, Pa. 18433

Filed May 20, 1976, Ser. No. 688,377
Int. Cl.² B44D *3/12*; B65D *25/00*
U.S. Cl. 220—90 **5 Claims**



1. A holder for paint brushes consisting of a platform to rest over the rim of a paint can, clamping members extending downwardly from the outer edge of said platform and over the outer side of said can, a wall extending upwardly from said platform having a portion bent at a right angle extending over said can, means in said portion for securing the handle of a brush and a curvilinearly-shaped portion extending from the inner edge of said platform downwardly into said can and engaging the same and forming a trough accepting the bristles of said brush, said trough having an upwardly-extending portion terminating in a rim adapted for the removal of excess paint from said brush, the cooperation of the clamping members and curvilinear-shaped portion securing the holder to the can.

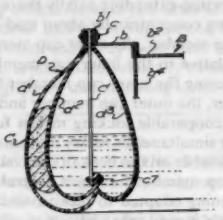
4,014,454

FLOATING ROOFS FOR LIQUID STORAGE TANKS

Irene Mary Nayler, Dudley, and Michael Stalker, Manchester, both of England, assignors to Greengate Industrial Polymers Limited, Salford and Nayler Limited, Dudley, both of, England

Filed Oct. 28, 1975, Ser. No. 626,537
Int. Cl.² B65D *87/20*
U.S. Cl. 220—225 **3 Claims**

1. A liquid storage tank having a floating roof adapted to rise and fall with changes in level of the liquid in the tank, said tank and roof having coextensive radially spaced side walls, and a seal mounted on the roof to depend between said side walls, said seal being an annular bag having flexible inner and outer sides in contact with the respective side walls and a flexible internal wall separating the bag into radially inner and outer annular chambers, fastening means securing the top of said bag to the roof and allowing the bag to be suspended therefrom between said side walls with its outer flexible side in sliding contact with the tank side wall, an annular body of



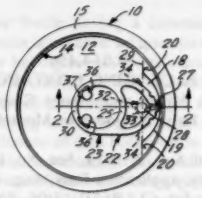
liquid in the inner chamber and an annular pad of synthetic foam within said outer chamber.

4,014,455

ACCURATE FLOW CONTROL CONTAINER MEANS

Leonard Thomas LaCroce, Paramus, N.J., assignor to American Can Company, Greenwich, Conn.

Filed June 21, 1976, Ser. No. 698,221
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **28 Claims**



1. An accurate pour-guiding and flow-controlling end closure of the partial-open, pull-tab type well suited for directional discharge handling of relatively non-viscous fluids, said closure comprising:

a generally flat central panel portion;

means associated with said central panel portion for securing said closure as an end cover for a container to be sealed therewith;

a rupturable peripheral score line in said central panel which defines and circumvents a displaceable portion of said central panel which displaceable portion is bendable inwardly upon rupture of said peripheral score line to form an opening in said central panel;

said rupturable peripheral score line having curled terminal increments which delimit the length of the score line and inhibit panel tearing therebeyond when said displaceable portion is inwardly bent and disposed upon rupture to form said opening of said score line; and

an opening tab attached to said displaceable portion of said panel at a point at least substantially proximate a line extending at least generally between the areas of said curled terminal increments of said peripheral score line on said panel;

said opening tab having a nose portion at one of its ends and a handle portion at its other end permitting situation of the nose portion so as to be disposed proximate the rupturable peripheral score line in said central panel;

said pull ring of the opening tab being disposed radially inwardly from its point of attachment on said cover and extending substantially beyond said point;

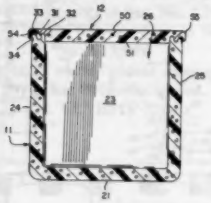
said opening tab adapted upon application of upraising leverage thereto to rupture said peripheral score line and inwardly bend said displaceable portion to form an open-

ing in said panel with said tab then extending vertically upwardly from said panel to stop in at least a substantially perpendicular disposition with respect to the plane of said central panel in which situation said tab is capable of a baffle and pour-guide function for fluid material issuing from and through said opening.

4,014,456
INSULATED SANDWICH AND SALAD KEEPER

Mary Louise Echtle, Star Rte., Box 5, Castroville, Tex. 78009

Filed Oct. 31, 1975, Ser. No. 627,780
Int. Cl.² B65D *43/10*
U.S. Cl. 220—306 2 Claims



1. An insulated salad and sandwich keeper comprising, in combination

a hollow box shaped receptacle of a hollow rectangular box-shaped configuration having a horizontal flat bottom surface, a pair of opposed vertically extending parallel front and back wall surfaces, and a pair of vertically extending parallel side wall surfaces, the surfaces defining interiorly thereof a compartment open at its top to provide ingress and egress thereof;

a cover of said receptable consisting of a flat rectangularly shaped solid member having an exterior surface and interior surface, opposed flat front and back edges, and opposed flat side edges, the cover being of a width and length to completely overlap the open top of said receptacle compartment and engage the top edges of the wall surfaces in an air tight manner for sealing the receptacle compartment when the cover is in place thereon;

said receptacle and cover manufactured of insulating material;

said receptacle being characterized by a longitudinally extending groove of a semi-circular cross section disposed in the top edge of each of the wall surfaces of the receptacle, a pair of rib members formed on the top edges of wall members with each rib member being disposed on an opposite side of the groove and extending longitudinally therealong, an annular recess of a semi-circular configuration disposed completely about the exterior surfaces of the wall surfaces to define a plane parallel to the receptacle bottom surface and disposed immediately adjacent the bottom portion of one of the rib members, and with said cover member including a pair of parallelly extending grooves disposed in the interior surface completely about the edge surfaces and of a size and configuration to receive the receptacle ribs therein, a rib extending between the cover grooves and adapted to be received in the receptacle groove whereby the cover is snap-fitted to the receptacle for sealing the receptacle compartment.

4,014,457
TRASH CONTAINER LID SYSTEM

Allan M. Hodge, 5852 Lomond Drive, San Diego, Calif. 92120

Filed May 20, 1976, Ser. No. 688,167
Int. Cl.² B65D *43/14*, *51/04*
U.S. Cl. 220—331 5 Claims

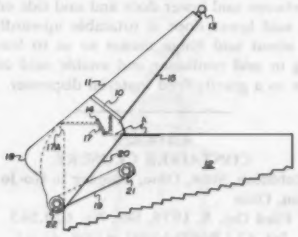
1. A trash container lid system for use with large industrial trash bins in which the lid is rotatably coupled to the trash bin by means of a lever arm and is slidably coupled to the trash bin by means of a roller on the lid, comprising:

a trash bin having an upper edge;

a lid section having a lower edge dimensioned for cooperation with said trash bin upper edge;

first and second lever arms, said first and second lever arms each being rotatably coupled at one end to first and second pivot points on said trash bin and rotatably coupled at their other end to third and fourth pivot points on said lid section;

first and second slide members carried by said lid section;



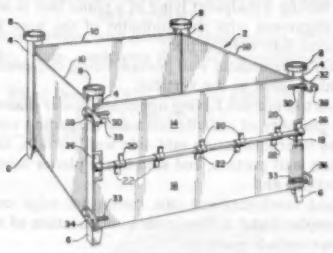
first and second slide tracks on the top of opposite edges of said trash bin, said first and second slide tracks slidably carrying said first and second slide members; and

a raised portion at the back termination of said first and second slide tracks, to stop the rearward movement of said lid section when it is raised rearwardly for the purpose of opening said bin to receive trash; whereby said lid can remain in a stabilized partially opened position.

4,014,458
THREE-FUNCTION CONTAINER

Timothy J. Berges, Mansfield, Ohio, assignor to Sanchez Enterprises, Inc., Mansfield, Ohio

Filed Mar. 19, 1976, Ser. No. 668,694
Int. Cl.² B65D *43/24*
U.S. Cl. 220—335 3 Claims



1. A three-function material handling container comprising,

a bottom section,

a wall structure extending upwardly from said bottom section and including extending side edge portions and a lateral opening therebetween,

upper and lower doors extending across said lateral opening in said wall structure,

hinge means for each door disposed on an axis substantially parallel to said bottom section, each of said hinge means pivotally connecting its associated door to said upwardly extending side edge portions of said wall structure at a level intermediate said bottom section and the top of said wall structure,

a first latch means engageable between said lower door and at least one of said side edge portions beneath said hinge means so as to hold said lower door in a lowered position and said upper door being rotatable about said hinge means to a lowered position so as to leave an upper lateral

opening in said container and enable said container to function as a hopper into which material may be laterally conveyed,

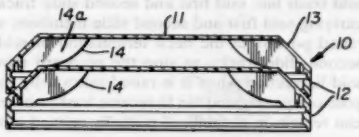
a second latch means engageable between said upper door and at least one of said side edge portions above said hinge means so as to hold said upper door in a raised position so that said upper and lower doors held in their respective raised and lowered positions form with said wall structure a laterally closed material storage box,

and said first latch means being detachable from its engagement between said lower door and said side edge portion so that said lower door is rotatable upwardly and outwardly about said hinge means so as to leave a lower opening in said container and enable said container to function as a gravity-feed material dispenser.

4,014,459
CONTAINER CLOSURE

Ronald L. Robinson, Stow, Ohio, assignor to Go-Jo Industries, Inc., Akron, Ohio

Filed Oct. 8, 1975, Ser. No. 620,563
Int. Cl.² B65D *55/00, 43/08, 41/18*
U.S. Cl. 220—380 **1 Claim**



1. A container closure for removable placement over the open end of a container body, comprising;

A. a substantially flat top portion;

B. a substantially vertical side wall portion;

C. an intermediate wall portion interconnecting said side wall portion and said top portion;

D. said top portion

1. having a circumferential dimension less than the circumferential dimension of said side wall portion, and

2. having a midpoint lying in a plane that is in substantial alignment with the midpoint of the area bounded by said side wall portion;

E. said intermediate wall portion being disposed at an angle with respect to the vertical;

F. said top portion having upper and lower planar faces; and

G. a plurality of radially inwardly extending reinforcement ribs interconnecting said side wall portion, said intermediate wall portion, and said lower planar face of said top portion; and

H. said reinforcement ribs having an edge configuration complemental to the outer configuration of said top and intermediate portions.

4,014,460
SPIKE ORIENTING AND POSITIONING SYSTEM

John F. Bryan, Jr., 3212 Mapleleaf Circle, Dallas, Tex. 75233

Filed Jan. 2, 1975, Ser. No. 538,115
Int. Cl.² B65G *47/24*
U.S. Cl. 221—156 **56 Claims**

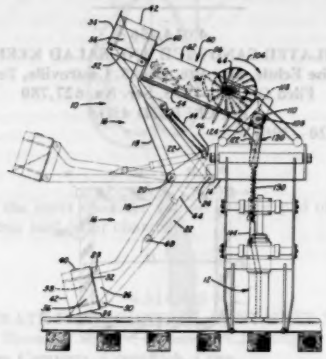
1. A spike orienting and positioning system comprising:

means forming an inclined surface for receiving a plurality of randomly oriented spikes each having a head and a shank and having at least one spike receiving slot formed therein defined by spaced, parallel surfaces positioned to receive spike shanks therethrough and to support received spikes by engagement with the spike heads;

means for agitating spikes comprising the plurality of randomly oriented spikes received on the surface so that spikes from the plurality fall into the slot formed in the surface;

means for normally retaining spikes in the slot formed in the surface and for selectively discharging individual spikes from the slot;

a helix for receiving individual spikes from the slot with the heads of the spikes randomly oriented relative to the spike axes and for rotating each received spike through at



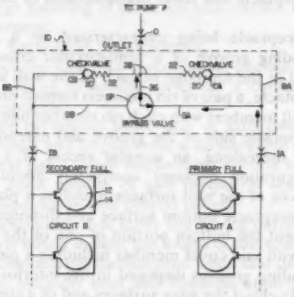
least one complete rotation about its axis and thereby positioning the head of the spike in a predetermined orientation relative to the spike axis regardless of the original orientation of the spike; and

means for receiving each spike from the helix and for positioning the spike to be driven.

4,014,461
AUTOMATIC CHANGE-OVER DEVICE FOR LIQUID DISPENSING SYSTEM

William Andrew Harvill, Decatur, Ga., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Mar. 10, 1976, Ser. No. 665,973
Int. Cl.² B65D *35/22*
U.S. Cl. 222—94 **8 Claims**



1. An automatic change-over device for a liquid dispensing system comprising:

first and second sets of at least one collapsible bag for containing a liquid to be dispensed, each of said collapsible bags having a first volume when full and deflating to a second volume when empty;

pump means for drawing said liquid out of said first or second sets of collapsible bags when in circuit with said first or second sets, respectively;

first pressure sensitive valve means in circuit between said first set of bags and said pump means, said first pressure sensitive valve means being normally closed and being opened in response to a pressure change created by said second volume of said second set of bags;

second pressure sensitive valve means in circuit between

said second set of bags and said pump means, said second pressure sensitive valve means being normally closed and being opened in response to a pressure change created by said second volume of said first set of bags; and

bypass valve means for selectively connecting either said first or second sets of bags to said pump means in parallel with either said first or second pressure sensitive valve means, respectively.

4,014,462

SCRAP RECOVERY AND FEED SYSTEM

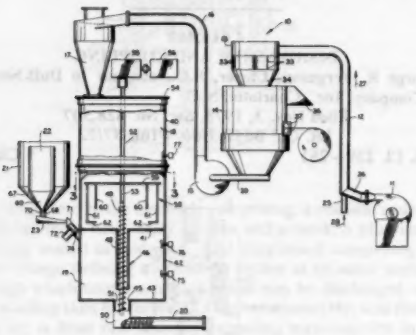
Joseph D. Robertson, 980 Swathmore Drive, NW., Atlanta, Ga. 30327

Continuation of Ser. No. 439,029, Feb. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 128,973, March 29, 1971, Pat. No. 3,797,702. This application Nov. 5, 1975, Ser. No. 629,070

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² B01F *7/24*

U.S. Cl. 222—136 **11 Claims**



6. A blend system for blending a mixture of a relatively flowable base material and a relatively non-flowable material comprising a hopper with an inlet opening for receiving the non-flowable material and an outlet opening at its lower portion, a chamber positioned below said hopper and including an inlet opening for receiving the flowable base material and an outlet opening at its lower portion whereby the flowable base material moves under the influence of gravity toward and accumulates in said chamber, and a conveyor in said hopper extending from within said hopper in a downward direction from said hopper to the outlet opening of said chamber and exposed along its lower portion inside said chamber for urging said non-flowable material from the hopper in a downward direction into the chamber and with the base material toward the outlet opening of said chamber whereby the base material and the nonflowable material are combined and are discharged through the outlet opening of the chamber.

4,014,463

PLURAL COMPONENT DISPENSER

Paul F. Hermann, Andover, Mass., assignor to Kenics Corporation, North Andover, Mass.

Filed Nov. 28, 1975, Ser. No. 636,156

Int. Cl.² B67D *5/60*

U.S. Cl. 222—145 **7 Claims**

1. A plural component dispenser comprising:

a. two rigid chambers each having a uniform transverse area along its operable length;

b. a rigid piston spanning said transverse area in each of said chambers, each piston being movable along said chamber throughout said operable length;

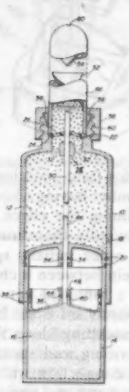
c. common operating means related to both of said pistons and adapted to move both of said pistons synchromously along their respective chambers;

d. each of said chambers containing a fluid to be dispensed;

e. each of said chambers being provided with an exit port through which its fluids are ejected upon motion of the piston in said chamber;

f. a mixer connected to said dispenser, said mixer having an input end and a discharge end;

g. said ports being located closely adjacent said input end of said mixer;



h. said mixer comprising a hollow conduit containing a plurality of serially disposed of helical sheet-like elements, each of which has its trailing edge at a substantial angle with respect to its leading edge, the leading and trailing edges of adjacent elements being at a substantial angle with respect to each other and successive elements being curved in opposite senses.

4,014,464

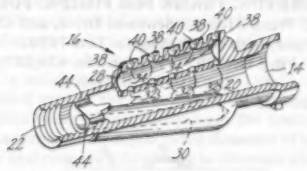
HOT MELT DISPENSER AND METHOD OF MAKING ITS MELT BODY

Albert Eugene Newton, and Richard Montgomery Elliott, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Dec. 9, 1975, Ser. No. 639,074

Int. Cl.² B67D *5/62*

U.S. Cl. 222—146 HE **9 Claims**



1. In apparatus for progressively melting and dispensing thermoplastic material, an elongated body, the body having a generally frusto-conical hot melt chamber extending substantially from an inlet for the material in its solid form and toward a relatively smaller outlet for the material when liquefied, said chamber being defined by an essentially smooth wall, the body being constructed for heat transfer relation to a heater, at least one manifold by-pass extending generally parallel to the chamber wall, at least one axially drilled auxiliary channel in the body interconnecting the smaller end of the melt chamber to the body outlet, and a plurality of radially drilled holes spaced along the chamber substantially in a line to bleed off and conduct the material as melted into the by-pass.

4,014,465

PAINT CAN POUR SPOUT

John C. Ritter, 12645 Duchess, Detroit, Mich. 48224

Filed Sept. 2, 1975, Ser. No. 609,383
Int. Cl.² B65D *25/48*
U.S. Cl. 222—563 **1 Claim**

1. A pour spout lid for fluid containers comprising:

a circular planar member having a square aperture with two edges thereof defining the edges of a spout extending upwardly and outwardly therefrom, the planar member having inner and outer radially spaced circular flanges which define therein between a channel adapted to snap lockingly engage a rim of a conventional fluid-holding container; said planar member being provided with a peripheral bead extending along the edge of said planar member circumscribing said square opening and terminating in integral connection with said pour spout such that said pour spout and said peripheral bead completely surround said square opening;

means defining an opening in said outer circular flange to permit the insertion of a removing means cooperating with said can rim to facilitate the removal of said lid from said container;

a plurality of circumferentially spaced, downwardly extending members disposed at the corners of said square aperture on the bottom side of said planar member to prevent the overflow of fluid from within said container onto the top of said planar member when the fluid contents of said container are tangentially stirred;

a cover having a top wall with inwardly inclined depending side walls of a square configuration, said side walls matingly engaging said square aperture to enclose said aperture; and

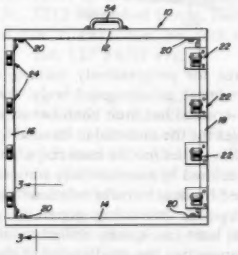
a handle formed on the top of said top wall to permit the removal of said cover from said square aperture.

4,014,466

CARRYING FRAME FOR FISHING POLES

Kenneth F. Wess, 3106 Lindenwood Drive, and Charles Day, Ratliff Road, both of San Angelo, Tex. 76901

Filed Oct. 20, 1975, Ser. No. 624,267
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 R **2 Claims**



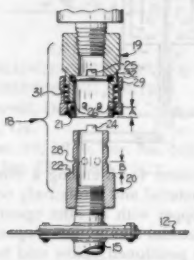
1. A hand carrying device for supporting a plurality of elongated structures therefrom, said device including spaced portions thereof from which support structures comprising clamp holding members are mounted adapted to engage longitudinally spaced portions of elongated structures for removable support of the latter from said support structures, said carrying device comprising an upstanding rectangular frame including a pair of vertically spaced upper and lower elongated members and a pair of opposite end upstanding elongated members extending and interconnected between corresponding ends of said upper and lower members, said upstanding members comprising said spaced portions, said upper, lower and upstanding members comprising channel members of generally C-shape cross section with the free ends of the legs thereof each terminating in successive right angled inturned first and second flanges, threaded nut sleeves mounted in the ends of each of said elongated members including inner heads underlying the corresponding second flanges and noncircular shank portions slidingly received between the opposing surfaces of the corresponding second flanges with the latter preventing rotation of said sleeves, and angle braces connecting pairs of adjacent ends of said elongated members by means of threaded bolts secured through said angle braces and threadedly engaged in said sleeves.

4,014,467

DISHWASHER AND COUPLING

George R. Ferguson, Clover, S.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Nov. 3, 1975, Ser. No. 628,507
Int. Cl.² B05B *3/06;* **F16L** *37/22*
U.S. Cl. 239—261 **9 Claims**



9. In a dishwasher having housing means for enclosing dishes to be washed and means for circulating fluid within said housing means for washing dishes and including fluid conduit means having portions extending within said housing means, an improvement which comprises manually disengagable coupling means interposed between two of said conduit means portions for joining the same together while resisting rotational and angular displacement therebetween, and wherein said coupling means comprises first and second telescoping tubular coupling members each having a radially directed abutment shoulder and axially directed rotation locking surfaces; locking members carried by one of said coupling members for radial movement relative thereto at a predetermined distance from said shoulder thereof; locking recess means for receiving said locking members and formed in the other of said coupling members at a distance from said shoulder thereof less than said predetermined distance; and manually operable means for selectively (a) releasing said locking members to freely move radially in accommodation of telescopic relative movement between said coupling members and (b) urging said locking members radially toward said other coupling member and into engagement with said locking recess means; the configuration of said locking members and said locking recess means and the spacing thereof one relative to the other being such that said locking members extend into said locking recess means for less than the full radial depth thereof and wedge thereagainst for exerting therebetween a force directed axially of said coupling members, said locking

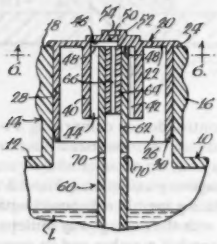
members and said locking recess means functioning when in engagement for urging said shoulders into abutment so as to prevent angular displacement between said coupling members and for positioning said rotational locking surfaces for engagement so as to prevent rotational displacement between said coupling members.

4,014,468

SQUEEZE BOTTLE DISPENSER WITH IMPROVED DIP TUBE AND METHOD OF ASSEMBLING SAME

Paul Silverman, and William R. Bartuska, both of Skokie, Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed May 5, 1975, Ser. No. 574,605
Int. Cl.² B65D *1/32*
U.S. Cl. 239—327 **5 Claims**



1. A squeeze bottle assembly comprising: a resilient squeeze bottle having a main body portion and a neck, a plug insert sealingly seated in said neck, said plug insert comprising an upper flange defining a discharge orifice at its outer surface through which contents of said bottle may be discharged, and a depending skirt for receiving a dip tube assembly, said flange defining at least one laterally extending metering slot in its lower surface in communication with said discharge orifice, said slot terminating laterally outwardly adjacent said skirt, and a dip tube assembly disposed and held within said depending skirt, said dip tube assembly comprising an elongate hollow dip tube extending downwardly from said skirt to adjacent the bottom of said main body portion and a short tube element positioned against lower surface of said flange and defining a passageway which is in flow communication with said metering slot at one end and which is in flow communication with the hollow in said dip tube at its other end, said skirt and said dip tube assembly defining air passage means therebetween which is also in flow communication with said laterally extending slot, thereby to provide for the mixture of air with bottle contents conveyed through the dip tube assembly adjacent the upper end of the dip tube assembly and wherein the passageway through said short tube element is from about 0.014 to about 0.040 inch in diameter, which diameter is substantially less than the diameter of the hollow in said dip tube, wherein said short tube element is from about one-sixteenth to about 1 inch in length, and wherein said short tube element is disposed within said elongate dip tube and the upper ends of said element and said dip tube lie in a common plane and are flush with each other and with said lower surface of said flange.

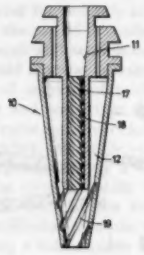
4,014,469

NOZZLE OF GAS CUTTING TORCH

Kozo Sato, No. 7-12, Minami-3-chome, Yamamoto-cho, Yao, Osaka, Japan

Filed Nov. 17, 1975, Ser. No. 632,220
Int. Cl.² B05B *1/34*
U.S. Cl. 239—404 **4 Claims**

1. A nozzle of a gas cutting torch comprising an inner cutting gas passage tapered towards an outlet thereof with helical grooves extending to the outlet thereof, and a heating gas passage tapered towards an outlet thereof and annularly surrounding said inner passage, said heating gas passage having helical grooves extending to the outlet thereof.

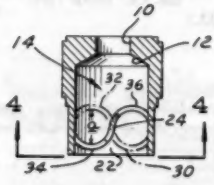


4,014,470

CONICAL SPRAY NOZZLE

Richard C. Burnham, Greenfield, Mass., assignor to Bete Fog Nozzle, Inc., Greenfield, Mass.

Filed Mar. 1, 1976, Ser. No. 662,834
Int. Cl.² B05B *1/34*
U.S. Cl. 239—472 **7 Claims**



1. Full cone spray nozzle comprising a fluid conduit having an outlet orifice, vane means within said conduit for imparting a vortical component of motion to liquid flowing therethrough, said vane means having an opening therethrough transversely of the conduit which is substantially smaller than the outlet orifice and is in axial alignment therewith, said vane means including sinusoidal portions in edge-to-edge relation spanning adjacent semi-circular segments of the conduit, each sinusoidal portion including convex and concave lobes interconnected by axially extending leg portion, said convex lobes being disposed toward the inlet end of the conduit and the concave lobes being offset axially from the convex lobes a distance at approximately equal to the diameter of said orifice, said convex and concave lobes being in alternate circumferential sequence in said conduit.

4,014,471

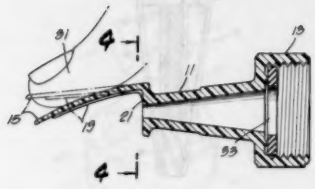
HOSE NOZZLE DIVERTER

George M. McGrane, 1017 Loma Verde St., Monterey Park, Calif. 91754

Filed Nov. 17, 1975, Ser. No. 632,816
Int. Cl.² B05B *1/26*
U.S. Cl. 239—510 **10 Claims**

1. Nozzle means for selectively converting a stream from a hose into a spray, comprising:

a. a first end adapted for coupling to said hose, and



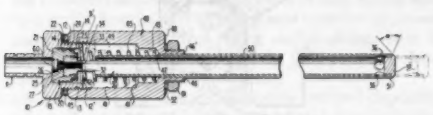
b. a second end including flexible flap means having at least one reinforcing rib.

4,014,472

DISCHARGE NOZZLE STRUCTURE

Richard Nelson Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Aug. 18, 1975, Ser. No. 605,331
Int. Cl.² B05B *1/30*
U.S. Cl. 239—533.1 **18 Claims**



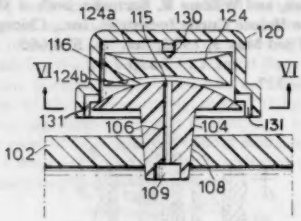
1. A nozzle structure for use with high-speed filling machines operable to fill containers with a product discharged under pressure, which comprises first means defining a cylinder section of a first diametric dimension adjoined by a space section of larger diametric dimensions and including further means for admitting a product under pressure into the space section by way of the cylinder section, an outer sleeve means securely connected near one end thereof to said first means and extending therefrom towards its other end in a direction opposite to the cylinder section, second means including a piston section of complementary dimensions to and slidable within said cylinder section and hollow inner sleeve means fixedly connected at one end thereof with said piston section and in continuously open communication with said space section, said hollow inner sleeve means being provided with discharge hole means near its other end, said second means having a first position in which said discharge hole means are closed off by said outer sleeve means and the space section is substantially closed off with respect to the further means for admitting the product under pressure so that the latter acts substantially exclusively on the exposed piston surface of the piston section, and a second position in which, after displacement of the second means by the product under pressure, the discharge hole means are free of the outer sleeve means and the further means for admitting the product under pressure is in communication with said space section so as to enable the discharge of the product from the further means by way of said space section, the hollow inner sleeve means and the discharge hole means, and spring means urging said second means into the first position thereof.

4,014,473

FLUID-FLOW CONTROL DEVICES PARTICULARLY USEFUL AS DRIPPER NOZZLES IN TRICKLE IRRIGATION

Peretz Rosenberg, Moshav Beit Shearim, Israel

Continuation-in-part of Ser. No. 364,049, May 25, 1973, Pat. No. 3,938,552. This application Dec. 15, 1975, Ser. No. 640,856
Claims priority, application Israel, June 11, 1975, 47455
Int. Cl.² B05B *15/00*
U.S. Cl. 239—542 **6 Claims**



1. A fluid-flow control device comprising a conduit member connectable to a source of pressurized fluid and formed with an axial passageway having an inlet and an outlet, a housing enclosing the passageway outlet and formed with a housing outlet, and a regulating member disposed within the housing in axial alignment with the passageway outlet and freely movable axially of the conduit member and its passageway to open and close its outlet, the face of the conduit member in which the passageway is formed, and the face of the regulating member closing the passageway outlet, being such that when the two faces are in contact to close the passageway outlet, the faces diverge from each other to provide a space between the two which space increases from the passageway outlet, whereby during the flow of fluid through the axial passageway the regulating member is set into rapid oscillating movement axially of the conduit member passageway to rapidly open and close its outlet and thereby to control the flow of fluid therethrough; characterized in that the conduit member face formed with the passageway outlet is of convex configuration, and that both faces of the regulating member are of concave configuration of a slightly larger radius of curvature, the inner surface of the housing including a depending boss adapted to engage the center of the confronting concave face of the regulating member.

4,014,474

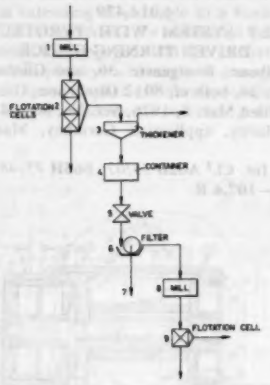
METHOD FOR TREATING PARTICULATE MASSES FROM COMPLEX ORES OR ORE PRODUCTS BY FROTH FLOTATION

Lars Alrik Anttila, Malmberget; Per Anders Herman Henningsson Fahlström, Akers Runo; Ernst Olov Fägremo, Boliden; Verner Herbert Hedman, Boliden, and Sven Göran Åberg, Boliden, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sept. 24, 1973, Ser. No. 400,146
Claims priority, application Sweden, Sept. 2[illegible] 1972, 12414/72
Int. Cl.² B02C *23/12*
U.S. Cl. 241—20 **7 Claims**

1. A method of treating a flotation concentrate pulp containing at least two different minerals, the minerals having been flotated by means of collector reagents in a previous flotation step and being capable of separation by further flotation, comprising adding to a pulp having a density exceeding 20% by volume of solid material a reagent nullifying the effect of the previous used collectors on at least one of the minerals; using an average stay-time for the particles in contact with the reagent of at most 30 minutes; filtering the pulp so that formed reaction products and unreacted nullifying reagent is removed

with the liquid; reslurrying the filtered pulp obtained by means of water; subjecting the pulp obtained to a mechanochemical treatment step comprising chemical conditioning of the surfaces of the mineral particles and grinding whereby fresh



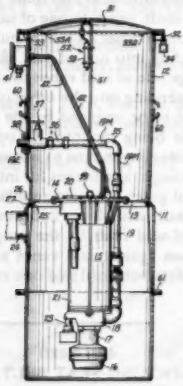
surfaces are formed on the mineral particles, controlling the grinding efficiency by the quantity of material supplied during said grinding and floating the pulp in at least one flotation step while suppressing at least one but not all the minerals present by means of suppressing agent addition.

4,014,475

COMBINED MANWAY AND COLLECTION TANK FOR SEWAGE GRINDER

Richard C. Grace, Carlisle, and Kenneth H. Rochow, Ballston Lake, both of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,708
Int. Cl.² B02C *13/18*
U.S. Cl. 241—36 **24 Claims**



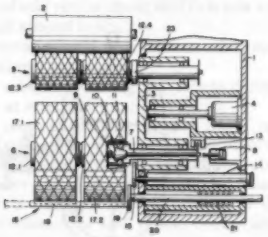
1. A new and improved sewage grinder pump and access manway assemblage comprising a lower collection tank having a watertight and airtight top cover plate and at least one sewage grinder pump unit suspended from the top cover plate and extending into the tank for grinding and pumping under pressure sewage collected in the tank, an integral manway housing member defining an enclosed space for accommodating a workman and supported over said collection tank, said manway housing member having a bottom area with cross-sectional dimensions slightly less than the cross-sectional dimensions of the upper portion of said collection tank and having enlarged openings in the bottom and top ends thereof, said collection tank having an upper peripheral wall section coacting with a lower peripheral wall section on the bottom of the manway housing member that defines the enlarged opening in the bottom end thereof for securely supporting said manway housing member on the top of the collection tank, means for securing the peripheral wall section defining the opening in the bottom end of said manway housing member around the upper peripheral wall section of said collection tank in a substantially airtight and watertight manner, a substantially weatherproof removeable top cover closing the top end of said manway housing member, means for venting the upper end of said manway housing member to a source of atmospheric pressure with the top cover in place without impairing the watherproof characteristics of the enclosure, said sewage grinder pump unit suspended from the top cover plate of said collection tank having a substantially airtight and watertight control housing within which an electric motor for driving the grinder pump and controls therefor are mounted, and breather vent pipe means connected to the interior of the control housing of said grinder pump unit and extending to the upper end of said manway housing member for venting said control housing to a source of atmospheric pressure.

4,014,476

APPARATUS FOR WINDING CONTINUOUS THREADS OR YARNS

Herbert Turk, Remscheid, and Herbert Schiminski, Huckeswagen, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Nov. 19, 1975, Ser. No. 633,455
Claims priority, application Germany, Nov. 21, 1974, 2455116
Int. Cl.² B65H *75/32, 67/04*
U.S. Cl. 242—19 **8 Claims**



1. An apparatus for winding continuous threads or yarns, said apparatus comprising:
   a rotable chuck having a stop mounted thereon;
   a removable spool sleeve slidably mounted on said chuck for thread take-up, a spacing lug on the end surface of said sleeve engaging said stop for spacing said end surface from said stop; and
   a means for cutting said thread located on said chuck in the space formed between said sleeve end surface and said stop.

4,014,477

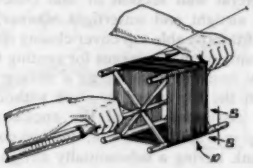
KITE REEL

Terry C. Hyun, 3421 Rivera St., San Francisco, Calif. 94116

Filed Oct. 9, 1975, Ser. No. 620,951
Int. Cl.² B65H *75/48*
U.S. Cl. 242—96 **6 Claims**

1. A kite reel for controlling the winding and unwinding of a line comprising:
   a. a spool member having an inner and an outer end, said spool member adapted for reception of a length of line about the spool, the outer end of said spool permitting unobstructed winding and unwinding of line;
   b. an elongate handle having a length substantially greater

than the axial length of said spool member, said handle extending from the inner end of said spool at a generally central location, said handle defining a neck portion adjacent the inner end of said spool, said spool member and handle having a center of balance in the said neck area at which center of balance the user can balance the



reel extending the handle substantially along the user's forearm to stabilize the reel; and

c. at least one crank handle associated with said spool and extending from the outer end of said spool and radially offset from the axis of the handle, said crank being rotative independently of said spool whereby the winding and unwinding of line is manually facilitated.

4,014,478

SECURITY WINCH FOR DIVERS

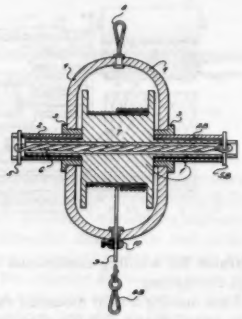
Jean-Claude Bonacina, 42 Rue Arson, 06 300 Nice, France

Filed Feb. 13, 1975, Ser. No. 549,825

Claims priority, application Monaco, Feb. 18, 1974, 10931001

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107 **3 Claims**



1. A winch comprising a housing having means for securement to a buoy, a drum located within said housing, a pair of hollow tubes extending outwardly of said housing along an aligned axis, a movable bushing interposed between said hollow tubes and said housing having an inner end engaging said drum, said bushings being axially adjustable relative to each other to position said drum within said housing, said drum having a hollow central shaft freely journalled concentrailly within the tubes, one end of said shaft extending outwardly of one tube, the other end of said shaft terminating within the other tube, an elongated line secured at one end to the drum and wound about its surface, the other end of said line extending out of said housing, a continous annular elastic band arranged along the axis of said hollow shaft, a first slot formed at the one end of said shaft extending from the associated tube, a pin received in said slot passing through the elastic band in engagement with said tube, a second slot formed in the tube adjacent the other end of said shaft, a pin received in said second slot and passing through said elastic band, thereby fixing said band to said housing, said drum being free movable on winding or unwinding of said line to torsionally bias said elastic band by a pull on said line providing motive power for the automatic return of said drum on release of said line.

4,014,479

SAFETY BELT SYSTEM WITH PYROTECHNICALLY DRIVEN TURNING DEVICE

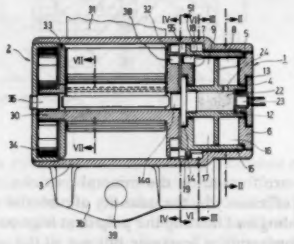
Karl Erik Nilsson, Rontgenstr. 30, and Günter Herrmann, Rontgenstr. 24, both of, 8012 Ottobrunn, Germany

Filed Mar. 5, 1976, Ser. No. 664,313

Claims priority, application Germany, Mar. 11, 1975, 2510514

Int. Cl.² A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 R **13 Claims**



1. A winding assembly for a vehicle safety belt system comprising a belt rolling device having a safety belt arranged in winding engagement therewith, a high speed turning device adapted to be driven by pyrotechnical gases, means for generating said pyrotechnical gases to drive said turning device when said vehicle is decelerated at a given rate, and interconnecting means for connecting said high speed turning device with said belt rolling device to effect winding therein of said safety belt when said pyrotechnical gases are generated, said high speed turning device comprising: a rotatably mounted shaft; means defining a pair of annular chambers about such shaft; a pair of vanes affixed to said shaft, said vanes extending radially from said shaft, one into one of said annular chambers and the other into the other of said annular chambers; a first fixed blade extending into one of said annular chambers and arranged to engage one of said vanes to stop rotation thereof; a second blade extending into the other of said annular chambers and arranged to be engaged by the other of said vanes, said second blade being mounted in operative relationship with said interconnecting means to impart driving rotation of said shaft therethrough; and means for introducing said generated pyrotechnical gases into said annular chambers to effect rotation of said shaft; said blades and vanes being arranged to permit rotation of said shaft by the propellant force of said pyrotechnical gases against said vanes and thereby to effect winding of said safety belt until said one vane engages said first fixed blade.

4,014,480

INERTIA LOCKING SEAT BELT RETRACTOR

Robert C. Fisher, 580 E. Long Lake Road, Bloomfield Hills, Mich. 48013

Filed Aug. 3, 1973, Ser. No. 385,315

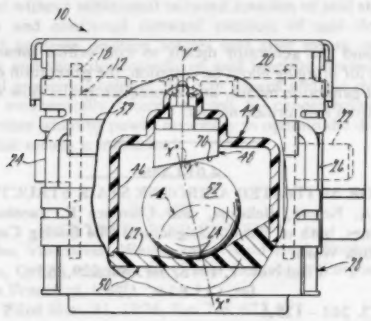
Int. Cl.² A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **2 Claims**

1. In a mechanism for locking a safety belt retractor against belt protraction, said retractor comprising a frame, a belt spool mounted for rotation on said frame, movable means for locking said spool against protraction, and a spherical inertia responsive member for moving said means to a locked condition, an improved seat for the direct support of said spherical member comprising a conical portion having a spherical portion at the apex thereof, the radius of said spherical portion

being larger than the radius of said spherical member whereby said inertia member engages said seat in point contact only at all times.

2. In a safety belt retractor comprising a frame, a belt spool having a ratchet thereon mounted for rotation on said frame about an axis extending at an angle to a horizontal plane, a pawl supported on said frame for movement between a locked position wherein it is engaged with the ratchet on said spool and an unlocked position wherein it is disengaged from the ratchet on said spool, a spherical inertia member, and a generally conical seat for said inertia member generated about a



vertical axis so as to substantially equalize the response of said inertia member to acceleration or deceleration in any direction parallel to said horizontal plane, the improvement comprising means engagable with said inertia member and reciprocable along an axis extending at an angle relative to the vertical equal to the angle of said spool axis relative to the horizontal, said reciprocable means being engagable with said pawl to bias said pawl into engagement with the ratchet on said spool, said reciprocable means having a surface engagable with said inertia member which is generated about a vertical axis.

4,014,481
TOWED CRAFT FOR REPRESENTING AERIAL TARGETS

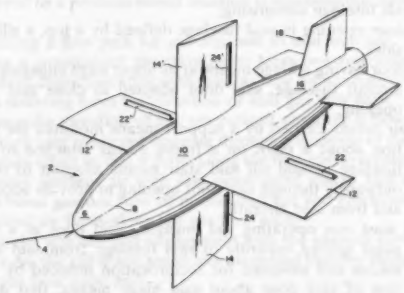
Wolfgang Daikeler, Friedrichshafen, and Klaus Uwe Exner, Immenstaad, both of Germany, assignors to Dornier GmbH, Germany

Filed July 11, 1975, Ser. No. 595,111

Claims priority, application Germany, Sept. 26, 1974, 2445938

Int. Cl.² B64C *13/28*; F41J *9/10*

U.S. Cl. 244—3 **1 Claim**



1. A target aircraft adapted to be towed by an airplane, comprising a fuselage, means for connecting a towing cable to the nose of said fuselage in the rolling axis thereof, a tail assembly, two pairs of wings mounted on said fuselage in a cross-like configuration,

a pair of spoiler means mounted in each pair of wings on hollow shaft means,

lever means connected to said hollow shaft means and having a free end thereof positioned between two electromagnet means,

and said hollow shaft means being connected with torsion rod means positioned inside said hollow shaft means, whereby said spoiler means return to an initial position thereof when said electromagnet means are currentless.

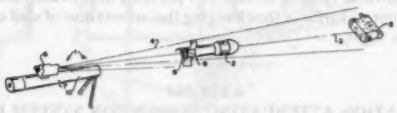
4,014,482
MISSILE DIRECTOR

Andrew T. Esker, Florissant; John L. Manche, Bridgeton, both of Mo., and Robert M. Siler, Anaheim, Calif., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 18, 1975, Ser. No. 569,445

Int. Cl.² F41G *1/46*; F42B *15/10*; G02B *27/00*

U.S. Cl. 244—3.13 **26 Claims**



1. A guidance system for directing the maneuvers of a guided device, comprising:

a single radiated beam source of producing a single radiated beam;

means for projecting said radiated beam along a first axis;

a reticle having the center of rotation positioned along a second axis, said reticle having a plurality of spokes extending outwardly from said reticle center, said reticle center being mounted for rotation about said first axis, said reticle being rotatable about said second axis, at least a portion of said reticle intersecting said beam during rotation of said reticle about said first axis and said reticle about said second axis;

means for rotating said reticle about said second axis at a first rotational speed;

means for orbitally rotating the reticle center about said first axis at a second rotational speed;

means for sequentially pulsing said single radiated beam source at a first rate during a first portion of one complete orbital revolution of said reticle center about said first axis, and for pulsing the single radiated beam source at a second rate during a second portion of one complete orbital revolution of said reticle center about said first axis;

means carried by said guided device for receiving the beam input from said radiated beam source; and

decoding means for providing information contained in said beam for positioning said device, said decoding means being operatively connected to said receiving means in said guided device, the information in said beam including distance and direction representations for permitting said guided device to determine a correction course to align itself with said first axis.

4,014,483
LIGHTER-THAN-AIR CRAFT

Roderick M. MacNeill, 23 Woodbury Road, Southborough, Mass. 01772

Filed Sept. 15, 1975, Ser. No. 613,221

Int. Cl.² B64C *39/00*; B64B *1/04*

U.S. Cl. 244—5 **12 Claims**

1. A lighter-than-air craft comprising:

A. a discus-shaped hull including upper and lower hull portions;

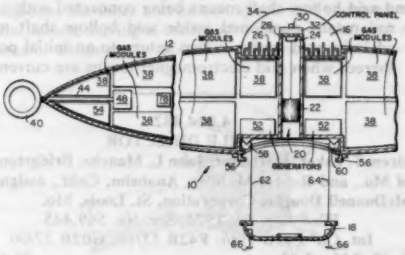
B. means for containing internally of said hull a volume of a lighter-than-air gas to provide lift to said craft;

C. propulsion means mounted to said hull for moving said craft in flight;

D. means for controlling said propulsion means; and

E. stabilizing means comprising a plurality of ailerons distributed about the periphery of said upper hull portion

and a plurality of ailerons distributed about the periphery of said lower hull portion, said ailerons being selectively



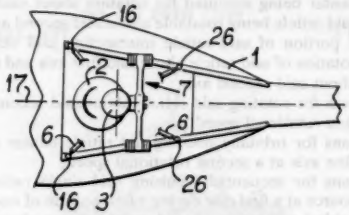
movable relative to said hull portions to provide variable control surfaces for changing the orientation of said craft in flight.

4,014,484

VIBRATION ATTENUATING SUSPENSION SYSTEM FOR ROTARY-WING AIRCRAFT ROTORS

René Louis Mouille, Aix-en-Provence (Bouches du Rhone), France, assignor to Societe Nationale Industrielle Aerospatiale, Paris (Seine), France

Filed Apr. 25, 1975, Ser. No. 571,863
Claims priority, application France, May 9, 1974, 74.16012
Int. Cl.² B64C *27/00*
U.S. Cl. 244—17.27 **12 Claims**



1. A suspension system for an aircraft, having a frame, a rotary wing supported on a vertical shaft and a motor/transmission unit for said rotary wing, said motor/transmission unit having a motor and gear box aligned in the direction of said shaft and being linked by a set of guy rods to said frame, comprising a single elongated beam member arranged transversely to the direction of the shaft supporting the rotary wing, said beam being rigidly secured at a middle portion between the ends of said beam to one side of the casing of said motor/transmission unit and extending at each of its ends into vertical supporting engagment with the frame of said aircraft so that said beam is rotatable in a plane perpendicular to and conjointly with the shaft, and means for resiliently securing each of the ends of said beam member to said frame to dampen the torque created by movement of said beam in said perpendicular plane.

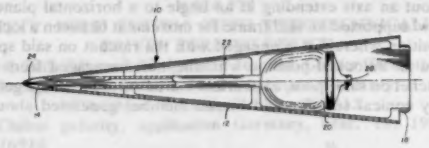
4,014,485

GAS COOLING SYSTEM FOR HYPERSONIC VEHICLE NOSETIP

Laird D. Kinnaird, and Seth B. Moorhead, Jr., both of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Apr. 14, 1975, Ser. No. 567,673
Int. Cl.² B64C *1/38*
U.S. Cl. 244—117 A **12 Claims**

1. An arrangement for protecting the nosecone of a vehicle during travel at hypersonic velocities, comprising a nosecone provided with a nosetip having orifice means, gas generator means in said vehicle in which comparatively large quantities of gases can be generated, said gas generator means containing a solid propellant, duct means for delivering such gases



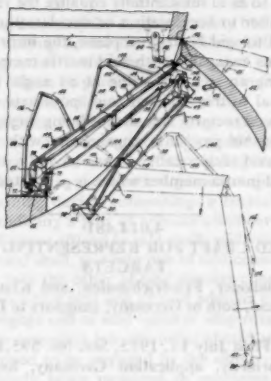
from said gas generator means to said orifice means, and means for bringing about on occasion, the generation of gases in said generator means, and consequently the flow of such gases from said orifice means.

4,014,486

DOOR ACTIVATED AIRBORNE STAIR STRUCTURE

Neal A. Nelson, Bellevue, and Clarence E. Jacobus, Des Moines, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1975, Ser. No. 629,865
Int. Cl.² B64C *1/24*
U.S. Cl. 244—129.6 **7 Claims**



1. An airborne stair and door structure for installation in an aircraft fuselage comprising:

a door opening in said fuselage defined by a top, a sill and sides;

a door having a hinge means at its upper edge engaging said aircraft fuselage, said door adapted to close said door opening;

stair means carried by a support means mounted for rotation about a pivot on a frame means attached to said fuselage at said sill said stair means adapted to rotate outwardly through said door opening to provide access to and from said aircraft;

at least one operating rod engaging said door at a pivot point spaced inwardly of said fuselage from said hinge means and mounted for reciprocation induced by rotation of said door about said hinge means, first downwardly upon initial movement of said door from a closed position, then past an over-center point and then upwardly upon continued rotation of said door toward an open position;

stair actuator means operated by said operating rod causing rotation of said stair means inwardly of said fuselage upon downward movement of said operating rod and outward

rotation of said stair means upon upward movement of said operating rod; and

yoke means engaging said support means and said operational rod adapted to convert reciprocative motion of said rod to rotative motion of said support means, said yoke means permitting continued upward reciprocation of said rod without continued rotation of said support means upon engagement of said stair means with the ground or other support surface;

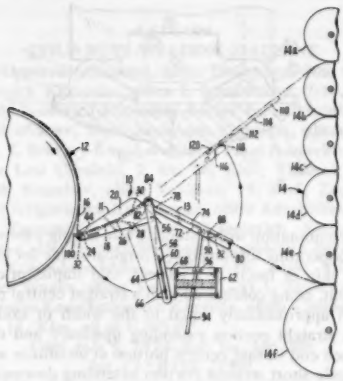
whereby initial outward rotation of said door from a closed position to an intermediate position whereat said stair can rotate outwardly without engaging said door is accomplished without substantial outward rotation of said stair means and continued outward rotation of said door toward an open position rotates said stair means outwardly and then downwardly of said fuselage toward a ground engaging position; the stair means and the door being mechanically interconnected to counterbalance each other whereby power necessary to operate the door and stair means is minimized.

4,014,487

WEB THREADING SYSTEM

Imants Reba, Vancouver, Wash., and Gerald Hugh Hogland, Estacada, Oreg., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Mar. 31, 1976, Ser. No. 672,172
Int. Cl.² B65H *17/32*
U.S. Cl. 226—5 **19 Claims**



12. A method of directing the tail of a moving web of flexible material to a predetermined location comprising the steps of:

positioning a flow path for gas adjacent to said web tail;

flowing a pressurized gas through at least one restricted opening communicating with said gas flow path in a direction differing from the direction of said gas flow path;

changing the direction of the pressurized gas after it flows through said restricted opening through utilization of the Coanda effect so that it flows along the first gas flow path;

entraining ambient air with said pressurized gas so that a combined gaseous flow of pressurized gas and entrained ambient air flows along the gas flow path;

placing the web tail into engagement with the gaseous flow whereby the tail is entrained and propelled thereby along the gas flow path; and

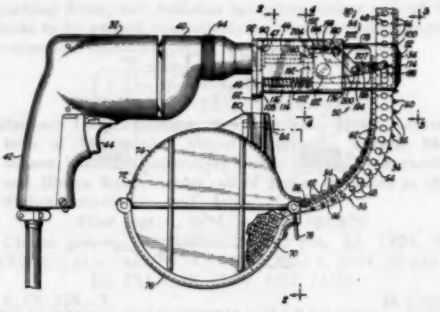
diverting the direction of a substantial portion of the gaseous flow away from said web tail through utilization of the Coanda effect while physically restraining said web tail in such a manner that the web tail is prevented from moving with said substantial portion of said gaseous flow but is not prevented from moving toward said predetermined location.

4,014,488

FASTENER FEED APPARATUS AND METHOD

Frank R. Potucek, Des Plaines, and Allen R. Obergfell, Park Ridge, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Division of Ser. No. 412,684, Nov. 5, 1973, Pat. No. 3,930,297.
This application July 10, 1975, Ser. No. 594,761
Int. Cl.² B65H *17/40*
U.S. Cl. 226—6 **6 Claims**



1. A method of controlling the movement of a strip of fasteners in increments to locate individual fasteners of the strip sequentially at a drive position, said method comprising:

periodically advancing the strip a distance equal to the space between fasteners;

deforming the strip after each said advancing step to provide a deformed portion of the strip; and

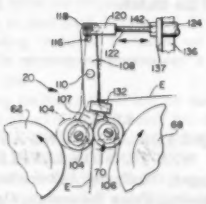
moving the deformed portion of the strip into engagement with a stop to prevent reverse movement.

4,014,489

VARIABLE YARN FEED DEVICE

Stephen M. Bialek, Barrington, R.I., assignor to Providence Pile Fabric Corporation, Fall River, Mass.

Filed Dec. 1, 1975, Ser. No. 636,552
Int. Cl.² B65H *17/20*, *17/52*
U.S. Cl. 226—9 **18 Claims**



1. A device for feeding strand at varying rates comprising, rotatable drive means for continuously gripping said strand, a first speed-control member rotatable at a first relatively slow surface speed in one direction, a second speed-control member spaced from said first member and rotatable art a second relatively fast surface speed in the opposite direction, means for supporting said drive means between said first and second members with said gripped strand always being maintained out of contact with said members, and means for selectively moving said drive means into operative association with said first or said second member so as to alternatively rotate said drive means at said first or said second speed, and accordingly vary the rate at which said strand is fed.

4,014,490
APPARATUS FOR FEEDING AND APPLYING FEATURES TO CONTINUOUS WEBS OR ITEMS THEREON

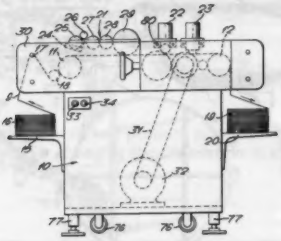
Donald James Joyce, London, England, assignor to Consort Project Development Limited, London, England

Filed Jan. 2, 1975, Ser. No. 537,866

Claims priority, application United Kingdom, Jan. 3, 1974, 00257/74

Int. Cl.² B65H *17/22*

U.S. Cl. 226—76 **11 Claims**



1. Apparatus for feeding continuous web material or items thereon to be processed, the apparatus comprising:

a. a machine bed,

b. drive means for feeding the web material over the machine bed,

c. a framework adapted for mounting at least one of a range of units above the machine bed whereby a variation of processing steps may be carried out on the web material or said items,

d. said drive means including a clutch for disconnecting the drive to the web material to provide a dwell period during which at least one processing unit may be operated while the web material is stationary,

e. means variable at will for operating the clutch at regular intervals to provide an operating cycle including at least one moving period and at least one dwell period,

f. whereby at least one selected processing step may be carried out on the web material or at least one of said items during each operating cycle,

g. said variable operating means comprising a disc which is rotatable by said drive means and carries at least one pair of projections spaced apart circumferentially on the disc for engagement in turn with a stationary member, and

h. means responsive to each said engagement to effect operation of the clutch.

4,014,491
ARRANGEMENT FOR ADJUSTING AND MEASURING WEB TENSION LEVELS

Hans Gref, Cologne; Wolfgang Schweicher; Hans Frenken, both of Leverkusen; Heinz Bussmann, Opladen; Karl Voss, Leverkusen; Helmut Schaffer, Opladen, and Willi Junkersdorf, Monheim, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

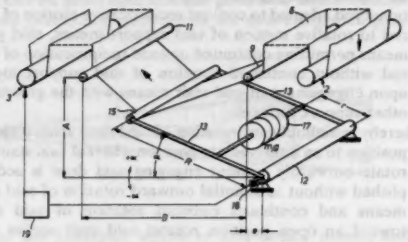
Filed Nov. 6, 1974, Ser. No. 521,500

Claims priority, application Germany, Nov. 9, 1973, 2356009

Int. Cl.² B65H *17/42*

U.S. Cl. 226—113 **5 Claims**

1. An arrangement for adjusting and regulating the tension level of a moving web of material, comprising at least one guide roller disposed in contact with the moving web of material, which turns around the guide roller, the guide roller being mounted for rotation on two substantially parallel torsion-resistant swing arms, the swing arms being disposed of an angle α with the horizontal, wherein α is situated in an angular range of $\pm 15°$ relative to an angle αm which is defined by the



position of the guide roller or rollers at which the tension in the web is a minimum.

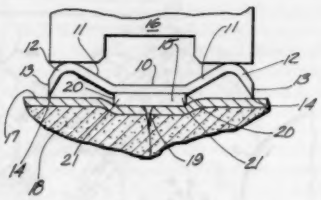
4,014,492
SURGICAL STAPLE

Robert G. Rothfuss, Bellevue, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed June 11, 1975, Ser. No. 585,804

Int. Cl.² B25C *5/10, 5/16;* **A61B** *17/10*

U.S. Cl. 227—19 **8 Claims**



1. In combination with a stapling tool having a forming anvil and a cooperating forming die, a surgical staple for joining the severed skin or fascia of a patient, said staple, prior to emplacement, being configured with a straight central portion of a length approximately equal to the width of said forming anvil, a straight portion extending upwardly and outwardly from each end of said central portion at an obtuse angle, and a relatively short straight portion extending downwardly and outwardly from the uppermost end of each of said upwardly and outwardly extending portions, said downwardly and outwardly extending portions terminating in vertical outer surfaces producing sharp points at the lowermost ends of said downwardly and outwardly extending portions, the upper corners of said forming anvil, about which said staple is formed by said die during emplacement of the staple, having a small radius of curvature, the points of said staple prior to emplacement, lying approximately in a horizontal plane passing through the centers of curvature of said small radii, said staple, when emplaced by said tool, having a box-like configuration, with the skin or fascia being joined thereby, everted within said box-like configuration.

3. A surgical staple for joining the severed skin or fascia of a patient, said staple, prior to emplacemen², being configured with a straight central portion, a straight portion extending upwardly and outwardly from each end of said central portion at an obtuse angle, and a relatively short straight portion extending downwardly and outwardly from the uppermost end of each of said upwardly and outwardly extending portions, said downwardly and outwardly extending portions terminating in outer vertical surfaces producing sharp points at the lowermost ends of said downwardly and outwardly extending portions

4,014,493

HOUSING FOR A STAPLER

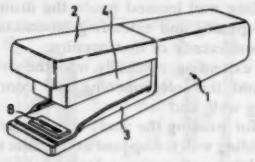
Maynard Frank Wolfe, Hong Kong, Hong Kong, assignor to Prodev Limited, Hong Kong, Hong Kong

Filed July 11, 1975, Ser. No. 595,261

Claims priority, application United Kingdom, July 29, 1974, 33479/74; Feb. 13, 1975, 6184/75

Int. Cl.² B25C *5/02*

U.S. Cl. 227—156 **8 Claims**



1. A housing for a stapler having a head which incorporates a staple magazine, and a base carrying a die, the head and the base being pivotally attached to one another, the housing comprising a first housing part attached to the base and extending over a portion of the head, and a second housing part attached to the head, relative pivoting movement of the head and the base being limited by the extension of the said first housing part over the said portion of the head.

4,014,494

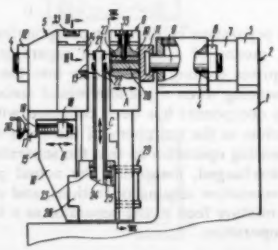
COLD BUTT-WELDING MACHINE

Nikolai Alexeevich Glagolev, ulitsa Tagilskaya, 20a; Gennady Alexeevich Klimenko, ulitsa I, Izhakevicha, 7/10, kv. 71; Anatoly Ivanovich Chvertko, Bulvar Lesi Ukrainki, 2, kv. 39, all of Kiev; Boris Ivanovich Kononets, ulitsa Ostrovskogo, 2, Brovary Kievskoi oblasti; Pavel Ivanovich Gursky, Bulvar Lesi Ukrainki, 2, kv. 58, Kiev; Vladimir Alexandrovich Nosachev, ulitsa Vavilova, 19, kv.5, Zaporozhie; Leonid Grigorievich Kravchenko, ulitsa Admiralteiskaya, 7, kv.8, Zaporozhie; Valentin Georgievich Basov, ulitsa Ulyanova, 19, Zaporozhie; Larisa Evgenievna Bogomolova, ulitsa Krasnoarmeiskaya, 129, kv.16, Kiev; Viktor Andreevich Ivanov, ulitsa Vesnina, 11, kv.1, Zaporozhie, and Konstantin Konstantinovich Khrenov, ulitsa Cheljuskintsev, 15, kv.11, Kiev, all of U.S.S.R.

Filed July 5, 1974, Ser. No. 486,206

Int. Cl.² B23K *21/00*

U.S. Cl. 228—3.1 **6 Claims**



1. A machine for cold butt welding of metal blanks, comprising: a machine bed; a mechanism for upsetting blanks, installed on said bed and including a power drive and a housing, the latter being installed on said bed with means for possible set turning in at least one vertical plane in relation to the direction of a substantially horizontal upsetting force; substantially horizontal guide members single-endedly fixed in said housing; two devices for clamping the blanks, with respective housings, installed on said guide members, so that one device is stationary while the other device is displaceable in the direction of the substantially horizontal upsetting force by means of said power drive; a carriage installed on said housing of the one clamping device; including movable and stationary portions, the former displaceable in the direction of the upsetting force; blades for cutting off the ends of the blanks, installed on portions of said carriage protruding between said housing of the clamping devices; a drive for displacing said blades in a vertical plane perpendicular to the direction of the upsetting force; two half-dies to accommodate one of the blanks to be welded, respectively positioned in said clamping devices; and individual drives for closing said half-dies.

4,014,495

AUTOMATIC WELDING APPARATUS

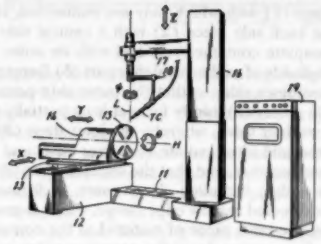
Tatsuharu Oda, Toyonaka; Yukio Iwasaki; Hideo Koyamd, both of Takarazuka; Shigeo Maruyama; Takashi Matsubara, both of Nishinomiya; Keiichi Hozumi, Takarazuka, and Hiroya Kano, Ashiya, all of Japan, assignors to Shin Meiwa Industry Co., Ltd., Japan

Filed Sept. 6, 1974, Ser. No. 503,879

Claims priority, application Japan, Feb. 22, 1974, 49-21824[U]; May 14, 1974, 49-54131; June 6, 1974, 49-64672

Int. Cl.² B23K *37/02, 5/02, 11/30*

U.S. Cl. 228—7 **16 Claims**



1. An automatic welding apparatus comprising:

a workpiece fixture for securing a workpiece thereto, said workpiece fixture being rotatable about an axis,

a welding torch,

means for holding said welding torch,

means for movably mounting said welding torch holding means including:

a guide extending in a first, horizontal direction,

a first sliding member mounted on said guide for sliding movement in said first, horizontal direction,

a second sliding member mounted on said first sliding member for sliding movement in a second, vertical direction, and

a third sliding member mounted on said second sliding member at an extremity thereof for sliding movement in a third, horizontal direction orthogonal to said first and second directions,

said welding torch holding means being carried by said third sliding member for rotation about an axis parallel to said second, vertical direction,

means for mounting said workpiece fixture for rotation about an axis extending parallel to said first, horizontal direction, and

means controlling the respective rotations of said workpiece fixture and said torch holding means and for controlling said movable mounting means for adjusting the relative positional relationship in said three directions of said workpiece fixture and said torch holding means.

5. An automatic welding apparatus in accordance with claim 1, which further comprises an adaptor detachably mounted at the end of said torch, said adaptor comprising a needle for indicating a welding point by the pointed end thereof and an elastic member for carrying said needle.

4,014,496

CUP FORMED CONTAINER HAVING EDGE FLANGE

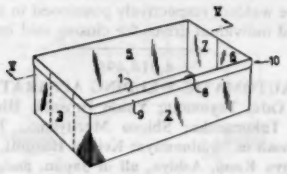
Od Wikar Christensson, Stockholm, Sweden, assignor to Asseltepac Aktiebolag, Jarfalla, Sweden

Filed Nov. 24, 1975, Ser. No. 634,771

Claims priority, application Sweden, Dec. 10, 1974, 7415448

Int. Cl.² B65D *5/24, 5/40*

U.S. Cl. 229—31 R **15 Claims**



1. Cup formed container made of a plain punched container blank of cardboard or similar stiff material and comprising a bottom (1), two opposite side pieces (2) which are coherent with the said bottom, and which are wider than the side of the bottom (1) with which they are connected, and two opposite joint flaps (3) which are of the same or less width than the side of the bottom (1) with which they are connected, characterized in that each side piece (2) with a central side part (5) forms a complete container side and with an outer side part (6,7) on each side of said central side part (5) forms part of an adjacent container side, so that the outer side parts (6,7) of the two side pieces (2) jointly form at least partially the intermediate container sides, whereby the joint flaps (3) serve to complete the said intermediate container sides and keep the parts thereof together, and that the container round the complete upper edge, including the corners, is formed with a downwards directed narrow edge flange, which is made of and folded from the same piece of material as the container sides and which forms an angle to the container sides, said flange being continuous and unbroken along said central side parts and said outer side parts of said side pieces, and hence around the corners of the container upper edge.

4,014,497

VERTICAL CENTRIFUGE

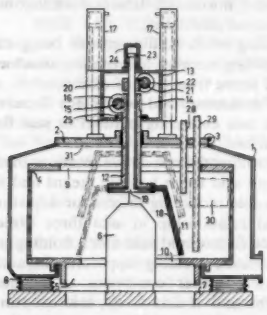
Leonhard Spiewok, Wallisellen, and Albert Bucher, Kriens, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,466

Claims priority, application Switzerland, Apr. 22, 1975, 005137/75

Int. Cl.² B04B *11/04*

U.S. Cl. 233—20 R **10 Claims**



1. A vertical centrifuge comprising

a. a housing provided with a cover which closes its upper end;

b. a centrifuge drum mounted in the housing for rotation about a vertical axis and having a top inlet opening and a bottom discharge opening;

c. means for leading material through the cover and the inlet opening to a region of the drum located at one side of said axis;

d. stripping means in said region for separating centrifuged material from the drum and thereby facilitating its discharge through the discharge opening;

e. a shielding wall located inside the drum above the discharge opening and extending around only a portion of the circumference of that opening;

f. a shaft extending vertically into the drum through the cover and the inlet opening and connected with the shielding wall; and

g. means for rotating the shaft between positions in which the shielding wall is disposed at opposite sides of said axis,

h. the shielding wall serving selectively to impede passage of material from said region to the discharge opening when positioned at the same side of the axis as that region, and to permit free passage of material from said region to the discharge opening when positioned at the opposite side of the axis.

4,014,498

METHOD AND APPARATUS FOR CENTRIFUGING SLUDGE-CONTAINING LIQUIDS

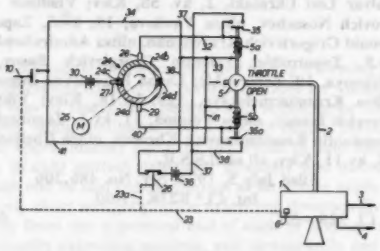
Edward Broadwell, Isleworth, and William Charles Thompson, Great Bookham, both of England, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Feb. 23, 1976, Ser. No. 660,730

Claims priority, application United Kingdom, Feb. 21, 1975, 1746/75

Int. Cl.² B04B *11/02*

U.S. Cl. 233—20 R **11 Claims**



1. In the separation of different components from a fluid mixture by means of a centrifugal separator, the method which comprises feeding the mixture into the rotor of said separator, sensing when a predetermined amount of a separated heavy component has been collected within the rotor, opening outlets at the periphery of the rotor in response to each said sensing operation so that the separated heavy component is discharged, measuring the actual period of time between consecutive sensing operations, and controlling the rate of the mixture feed to the separator as a function of the measuring operation.

4,014,499

TEMPERATURE CONTROL APPARATUS

William L. Hamilton, 9365 Euclid-Chardon Road, Kirtland, Ohio 44094

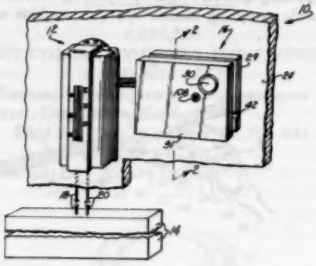
Filed Oct. 30, 1975, Ser. No. 627,047

Int. Cl.² G05D *23/32*

U.S. Cl. 236—46 R **20 Claims**

1. Temperature control apparatus for effecting operation of

an air conditioning system to maintain the temperature in a room at either a relatively high temperature or a relatively low temperature, said apparatus comprising a first thermoelectric control means for effecting operation of the air conditioning system to maintain the relatively low temperature, second thermoelectric control means for effecting operation of the air conditioning system to maintain the relatively high temperature, and circuit means for activating said first thermoelectric control means to maintain the relatively low temperature for a predetermined time period and for effecting activation of said



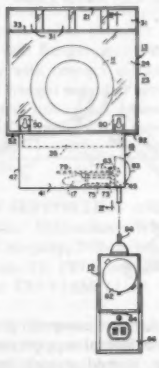
second thermoelectric control means to maintain the relatively high temperature after the predetermined time period has elapsed, said circuit means including storage means for holding an electrical charge, means for varying the charge in said storage means from a first magnitude to a second magnitude in said predetermined time period, and means for effecting activation of said second thermoelectric control means to maintain the relatively high temperature upon a change in the magnitude of the charge in said storage means to said second magnitude.

4,014,500

TEMPERATURE SET BACK

Charles S. Galtz, 2863 Beechwood Blvd., Pittsburgh, Pa. 15217

Filed Sept. 8, 1975, Ser. No. 611,078
Int. Cl.² G05D *23/30*
U.S. Cl. 236—46 R **8 Claims**



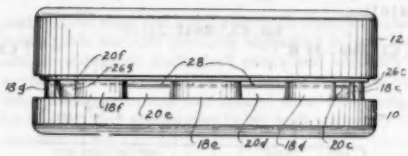
1. Temperature set-back control apparatus for setting back, during set-back intervals, the temperature of a region whose temperature is under the control of a thermostat at a position in said region sensing the temperature in said region at said position, the flow of ambient air in said region being directed towards said thermostat, the said apparatus including an enclosure enclosing said thermostat, providing a protective heated environment for said thermostat not susceptible to prevailing ambient air currents, said enclosure having an air inlet on one side of said thermostat and an air outlet on another side of said thermostat, said air outlet being transverse to the path of direct flow of said ambient air to said thermostat, switch means, operative during each of said set-back intervals to define each of said set-back intervals, and means, operable, only on said operation of said switch means during each set-back interval, connected to said enclosure, for preheating the air flowing into said inlet during said set-back intervals, thereby increasing the temperature in said enclosure and causing said thermostat to sense temperature higher than the ambient temperature in said region and to produce a set-back in said ambient temperature.

4,014,501

CONTAINER FOR AIR TREATING MATERIAL

Robert H. Buckenmayer, Stanhope, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed Feb. 24, 1976, Ser. No. 660,910
Int. Cl.² A61L *9/00*
U.S. Cl. 239—58 **11 Claims**



1. A dispenser for volatile materials comprising a base part for said volatile material, said base having a plurality of sidewall segments with apertures therebetween, projections extending from the exterior surface of at least two opposing sidewall segments and support means positioned within the area defined by said sidewall segments for suspending a layer of said volatile material in an elevated position intersecting said apertures; and

a cover for said base having at least one oblique groove on the interior of the side wall thereof,

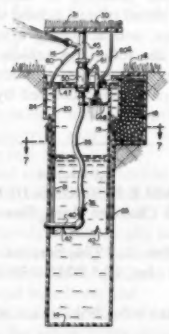
said groove engaging said projections facilitating rotation and corresponding raising and lowering of said cover to conceal or partially or totally expose said apertures.

4,014,502

LAWN, FARM, AND ORCHARD SPRINKLERS

Kerney T. Sheets, Duplessis, La., assignor to Kerney T. Sheets, Duplessis, La.

Division of Ser. No. 439,323, Feb. 4, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,457
Int. Cl.² B05B *15/10*
U.S. Cl. 239—206 **43 Claims**



1. A projectable lawn, farm, and orchard sprinkler comprising:

a. housing means having a top end and a bottom end;

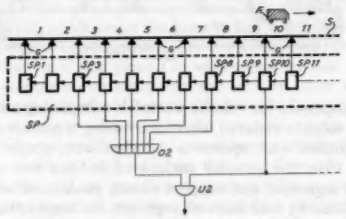
b. projectable float means located in said housing means;
c. sprinkler head means connected to said projectable float means for spraying fluids, said sprinkler head means having first pump means connected thereto for removing liquids from said housing means;
d. second pump means rigidly connected to said projectable float means for conveying air and liquids to the interior of said projectable float means to float said projectable float means upward within said housing means; and,
e. liquid supply means connected to said second pump means for supplying liquids under pressure to said second pump means and to said sprinkler head means.

4,014,503

METHOD AND APPARATUS FOR CONTROL OF CENTRAL SPACING OF TRACK-OPERATED VEHICLES

Juergen Raimer, Linden, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 31, 1975, Ser. No. 563,299
Claims priority, application Germany, May 17, 1974, 2424161
Int. Cl.² B61L *21/10*
U.S. Cl. 246—34 R **7 Claims**



1. A method for central spacing control of track-operated vehicles, particularly railroad vehicles, along paths which are subdivided into individual track sections for the positioning of the vehicles, which sections are continuously monitored as to occupation, in dependence upon the instantaneous position of the vehicles, preferably utilizing stationary information systems, particularly for railroad systems with a dense train succession and small track section lengths, and without continuous information systems between vehicles and a main office, comprising the steps of continuously monitoring in the main office, for the track sections indicated as being occupied by a vehicle or a series of coupled vehicles, a group of sections behind and a group of sections ahead thereof, defining a predetermined minimum distance between successive vehicles or series of coupled vehicles, to determine whether such groups of sections ahead of and behind the occupied sections are free of vehicles, and actuating a signal for initiating a forced braking of the following vehicle or vehicles when a section, in either of said groups, is indicated as occupied and thus is within the path range defined by such minimum distance.

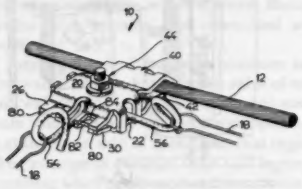
4,014,504

CABLE HOOKING DEVICE

Isaac Sachs, 2065 Chartier Ave., Dorval, Quebec, Canada (H9P 1H3)

Filed Feb. 2, 1976, Ser. No. 654,577
Int. Cl.² E21F *17/02*
U.S. Cl. 248—61 **20 Claims**

1. A hooking device for holding a cable from a suspended wire comprising:
a. a pair of substantially identical plates opposingly disposed, each plate comprising:
first and second end edges,
first and second lateral edges,
said first end edge being bent to provide a jaw means for gripping said suspended wire and having teeth asymmetrically formed therein,
said second end edge being bent to provide a hinging means and having:
1. first receiving means comprising a notch centrally located therealong,
2. guide means comprising:
i. a projection along one portion,
ii. a second notch at a second portion thereof, and
said first lateral edge having second receiving means comprising spaced fingers projecting therefrom;
b. releasable coupling means operable to bias said plates



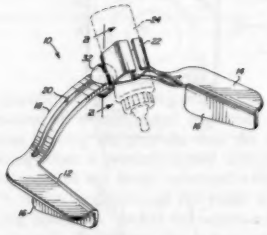
toward one another for securing said wire between said jaw means, and
c. at least one hooking member for holding said cable;
whereby said asymmetrically formed teeth of said first end edges of two opposingly disposed plates interdigitate, said projection along said one portion of a second end edge of one plate is inserted in said second notch at said second portion of a second end edge of a second plate thereby preventing relative lateral movement of the plates, and said central notches of the two plates together from the first receiving means and said fingers form the second receiving means, adapted to receive a hooking member perpendicular to and parallel to said wire, respectively.

4,014,505

NURSING BOTTLE SUPPORT

Harry J. Dowd, Phoenix, Ariz., assignor to Dowd & Holbrook Enterprises, Inc., Tempe, Ariz.

Filed June 16, 1976, Ser. No. 691,281
Int. Cl.² A47D *15/00*
U.S. Cl. 248—105 **10 Claims**



1. A nursing bottle support comprising:
a base having a pair of lateral support stretches and a transversely extending, slotted stretch interconnecting said lateral stretches, said slotted stretch being convexly curved and adapted to overlie the torso of an infant;
a holder adapted and configured to removably receive and hold a nursing bottle; and
pivotal, shiftable connector means extending through the slot of said slotted stretch to releasably secure said holder on a corresponding portion of said slotted stretch, said connector means permitting pivoting of said holder in a pair of mutually perpendicular planes one of which ex-

tends substantially perpendicular to the plane of said corresponding portion of the slotted stretch, said connector means and holder being shiftable as a unit along said slot of the convexly curved, slotted stretch,

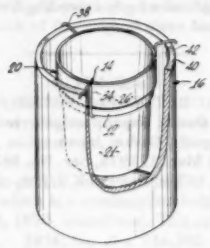
said connector means including a pair of hemispherical elements disposed on opposite upper and lower sides of said slotted stretch with surfaces frictionally engaging said upper and lower sides, said elements having narrow, through apertures therein and relatively arranged with said apertures aligned and lying in said one of the mutually perpendicular planes.

4,014,506

SUPPORT COLLAR ASSEMBLY FOR FLOWER POTS AND THE LIKE

Jack D. Hanson, Garden Grove, Calif., assignor to Hanson House, Inc., Long Beach, Calif.

Filed Apr. 25, 1975, Ser. No. 571,641
Int. Cl.² A47K 1/08
U.S. Cl. 248—311.1 **10 Claims**



1. In combination with a container having an outer marginal flange adjacent to the upper edge thereof and having a central vertical axis, a support collar assembly comprising:

a support collar member adaptable to be attached immediately below the flange of said container; and

a hanger assembly including a plurality of spaced mounting means each of which are pivotally attached to said support collar member and a plurality of hanger members each of which are affixed to each one of said plurality of mounting means, said hanger members each being rotatable about on an axis generally parallel to said container axis said support collar member in an arc of approximately 180°, said hanger members extending upwardly and outwardly with respect to said support collar member, each said hanger member terminating in a cantilevered support arm having a free end adaptable to be supported on a larger outer container.

4,014,507

SEAT SUPPORTING ASSEMBLY

Richard F. Swenson, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jan. 12, 1976, Ser. No. 648,137
Int. Cl.² F16M 11/00, 13/00
U.S. Cl. 248—407 **7 Claims**

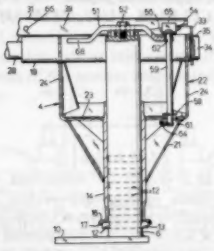
1. A seat assembly for a mobile vehicle and for rotatably and slideably supporting a seat, said assembly comprising:

a carriage for supporting said seat;

a rigid, stationary and generally vertical shaft securable to said vehicle;

a support frame rotatably supported by said shaft and vertically slideable on said shaft, said carriage slideably mounted on said frame for reciprocating movement relative thereto and between fore and aft positions; and

latch means for selectively preventing rotational movement of said support frame with respect to said shaft and operably connected between said shaft and said support frame and a releasing member operably connected to and carried by said carriage for disengaging said latch means when said carriage is moved to said aft position thereby permitting rotational movement of said support frame after said carriage has been slid to said aft position, said latch means including a stationary latch member fixed to



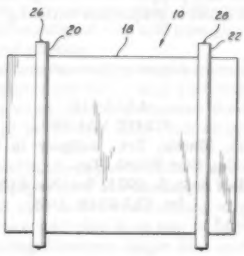
said vertical shaft and a shiftable latch member including a swingable member pivotably supported by said frame, and an elongated latch shaft positioned vertically and supported by said swingable member for swingable movement about a vertical axis spaced from said elongated latch shaft for engagement with said stationary latch member.

4,014,508

BOOK HOLDING DEVICE

Adelle Weiss, 214 Carol Ave., Pelham, N.Y. 10803

Filed Nov. 13, 1975, Ser. No. 631,511
Int. Cl.² A47B 97/04
U.S. Cl. 248—451 **6 Claims**



1. A book holding device, which comprises:

a. a board for supporting said book, said board having a front face and a rear face;

b. a pair of elongated relatively inflexible retaining members for retaining the respective left-hand and right-hand halves of said book against the front face of said board;

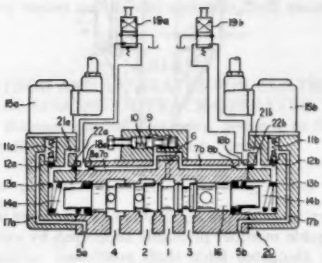
c. a pair of elastic cords for elastically securing said retaining members to said board, each of said elastic cords extending across the rear face of said board between the ends of one of said members; and

d. means located on said rear face of said board forming a pair of channels for respectively receiving and substantially enclosing a portion of said elastic cords for horizontal sliding movement between inner limits adjacent to the vertical centerline of said board and outer limits adjacent to and spaced from the outer periphery of said board.

4,014,509
PROPORTIONAL ELECTROMAGNETIC-TYPE DIRECTION- AND THROTTLE-CONTROLLING VALVE

Susumu Yoshino; Masaru Kikuchi, both of Fujisawa, and Hisakazu Ichioka, Yokohama, all of Japan, assignors to Yuken Kogyo Company Limited, Fujisawa, Japan

Filed May 28, 1975, Ser. No. 581,684
Claims priority, application Japan, May 31, 1974, 49-60785
Int. Cl.[2] F16K *31/42*; F15B *13/043*
U.S. Cl. 251—26 4 Claims

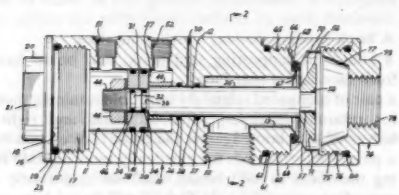


1. A proportional electromagnetic type direction and throttle control valve comprising a body with a plurality of ports, a spool slidable in said body for controlling communication between said ports, said body having chambers at opposite ends of said spool, springs in said chambers acting on said spool at the ends thereof, one of said ports being a pilot pressure port, a pressure reducing valve connected to said pilot pressure port, two pilot pressure passages being provided in said body connected to the output of said pilot pressure valve to receive pilot pressure flow therefrom, a flow restricting orifice in each pilot passage, each pilot pressure passage being connected downstream of said orifice with a respective said chamber, a discharge outlet being provided in each said passage between the associated orifice and chamber, a poppet valve for selectively closing each discharge outlet, a further spring acting on each poppet valve to urge the same to closed position and a D-C solenoid acting on each said poppet valve in series with the respective said spring for exerting an additional force on said poppet valve to urge said valve to close said discharge outlet in proportion to the input current to said solenoid.

4,014,510
PILOT VALVE

Carl K. Smith, Mathis, Tex., assignor to Midcon Pipeline Equipment Co., Fort Worth, Tex.

Filed Sept. 5, 1975, Ser. No. 610,777
Int. Cl.[2] F16K *1/46*
U.S. Cl. 251—63 7 Claims

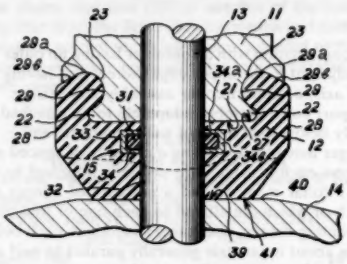


1. Pilot valve, comprising a valve body having a cylindrical piston chamber opening thereinto from one of its ends and having a cylindrical passage opening thereinto from the other of its ends, said chamber and passage being coaxially aligned, a cylindrical shaft passage extending coaxially between said chamber and said passage through said valve body, a ring member having one of its ends concentrically disposed around said other end of said valve body and sealingly connected thereto, said ring member having an inwardly projecting annular formation therearound one side of which is engaged with said other end of said valve body and the other side of which forms a valve seat, said other end of said vaove body having an annular inward portion aligned with said valve seat and forming a continuation thereof, a cylindrical valve shaft sealingly but slidably disposed through said shaft passage and extending into said chamber at one end and into said passage at the other end and fixed to a piston sealingly but slidably disposed in said chamber at its said one end and to a valve at its said other end, said valve being sealingly seatable against said valve seat and being moved to seat thereagainst by movement of said shaft in one axial direction and being moved away from said valve seat by movement of said shaft in the other axial direction, a first removable closure closing the open end of said chamber, a second removable closure having a fluid flow inlet therethrough closing the other end of said ring member, a first fluid port to said chamber through said valve body at one side of said piston and a second fluid port to said chamber through said valve body at the other side of said piston, and a fluid outlet through said valve body extending from said passage to the exterior of said valve body.

4,014,511
BUTTERFLY VALVE

Takayoshi Uno, Osaka, Japan, assignor to Tomoe Technical Research Company, Osaka, Japan

Filed Mar. 1, 1976, Ser. No. 662,446
Int. Cl.[2] F16K *1/226*
U.S. Cl. 251—306 2 Claims



1. A butterfly valve having an axially extending flow passage comprising:

a. a tubular valve body having a flat inner circumferential surface and a pair of radially extending end faces extending transversely to the flow axis,

b. an annular valve seat of resilient material having an outer circumferential surface engaging the inner circumferential surface of the valve body and an inner circumferential surface providing a seating surface and defining the axially extending flow passage,

c. a valve stem extending transversely through the valve body and the valve seat and being rotatably supported therein,

d. a valve disc supported by the valve stem inside the valve seat and having a peripheral edge engageable with the seating surface of the valve seat,

e. sealing means positioned in the valve seat around the valve stem for providing a seal between the valve stem and the valve seat,

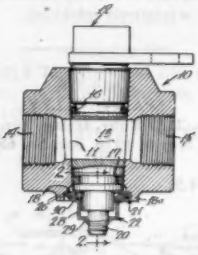
the improvement characterized by the valve body having a groove adjacent the juncture of each of the end faces and the flat inner circumferential surface of the valve body, each of the grooves extending radially outwardly from the inner surface and axially inwardly from the end face to provide the valve body with a radially inwardly extending dovetail projection which terminates in said flat inner

circumerential surface and a pair of arcuate end edges, each of said grooves having a radially outwardly and axially inwardly extending first arcuate surface which extends from one of the edges of the dovetail projection, a radially outwardly and axially outwardly extending second arcuate surface which extends from said first arcuate surface and a radially inwardly and axially outwardly extending flat surface which extends from said second arcuate surface to one of the end faces of the valve body, the outer circumferential surface of the valve seat having a flat central portion which engages the flat inner surface of the dovetail projection of the valve body, a pair of projections which are shaped complementarily to the arcuate end edges of the dovetail projection and the annular grooves in the valve body and which are received in the annular grooves whereby the maximum transverse dimension of each of the projections is spaced axially inwardly from the adjacent end face of the valve body, each of the projections of the valve seat terminating in a radially extending end face which is positioned axially outwardly and radially inwardly of the adjacent end face of the valve body, said flat surface of each of said grooves in said valve body extending at an angle of about 15° to 20° to the axis of the valve body.

4,014,512
TAMPERPROOF PLUG VALVE

Douglas L. Cheever, Dubuque, and Faye L. Knodle, Newton, both of Iowa, assignors to A. Y. McDonald Mfg. Co., Dubuque, Iowa

Continuation-in-part of Ser. No. 566,785, April 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,447, June 3, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,386
Int. Cl.² F16K 5/16
U.S. Cl. 251—309 **4 Claims**

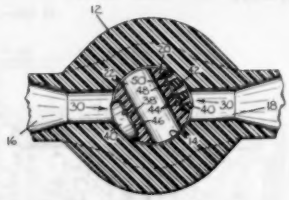


1. A tamperproof plug valve comprising, in combination:
a valve body which has a through bore, a planar base surrounding one end of said through bore, and an uninterrupted annular boss surrounding said planar base so the latter is recessed;
a valve plug rotatable in the through bore, said valve plug having cylindrical end portion that projects from said one end of said through bore, and there being a cylindrical extremity of reduced diameter on said end portion;
a substantially annular spring steel washer surrounding said end portion, said washer having an inner peripheral portion provided with slits that define teeth which snugly engage the end portion and slide thereon as the washer is moved toward the valve body, and which bite into said end portion to effectively prevent reverse movement of said end portion through the washer, and said washer having an outer peripheral portion and being transversely arched so that it has a crown portion flanked by lower marginal portions which seat on said planar base of the valve body with the periphery of the washer so close to the annular boss as to preclude insertion of a prying tool beneath the washer;
and a hollow nut which is in the shape of a cup with a side wall in encircling, spaced relationship to the end portion of the valve plug, an opening in the bottom of the cup which has teeth engaging a thread formed in said cylindrical extremity, and a frustoconical skirt at the forward margin of the cup which has an internal shoulder bearing on the inner peripheral portion of the washer close to the inner ends of the washer teeth and a rim bearing on the crown of the washer,
whereby said shoulder sets the washer teeth and said rim flexes the washer across said crown after the lower marginal portions of the washer seat on the planar base of the valve body.

4,014,513
CYLINDRICAL PLUG VALVE

Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1975, Ser. No. 636,874
Int. Cl.² F16K 5/04
U.S. Cl. 251—317 **5 Claims**



1. A valve comprising:
a valve body having a circular cylindrical bore with a first axis;
a pair of circular cylindrical passages formed in said valve body and intersecting said bore along a common second axis substantially normal to said first axis;
a circular cylindrical valve plug disposed in said bore and having a lesser diameter than said bore;
a circular port formed diametrically through said plug and aligned with said passages when said plug is in an open position and misaligned with said passages when said plug is in a closed position;
axially spaced annular sealing rings between said plug and said bore above and below said port and said passages establishing an annular fluid chamber therebetween, said sealing rings preventing fluid from escaping outwardly thereof;
a pair of diametrically opposed circular recesses formed in said plug along a third axis normal to said first axis and said second axis, said recesses being aligned with said passages when said plug is in said closed position, said recesses having diameters larger than said passages and each being defined by a circular cylindrical side wall and an annular flat bottom surface lying in a plane parallel to the first axis;
a cavity formed in said bottom surface coaxial with said third axis;
an annular resilient sealing member received in each recess, said sealing member having an outer surface engaging said side wall and a continuous bottom surface engaging periphery of the bottom surface of said recess with a center portion thereof defining a clearance space with the opposed surface of said cavity;
a circular cylindrical front surface on the sealing member having a diameter larger than said bore so as to be compressively engageable therewith in operative relationship in said recess;
a circular recess formed in said sealing member having a cylindrical surface coaxial with the front surface and

substantially the same diameter as said plug and peripherally outwardly defining a continuous constant height, constant thickness annular sealing lip constituting the engaging surface with said bore whereby the pressure in said annular fluid chamber is uniformly applied around the periphery of the lip to prevent a force imbalance thereon; and

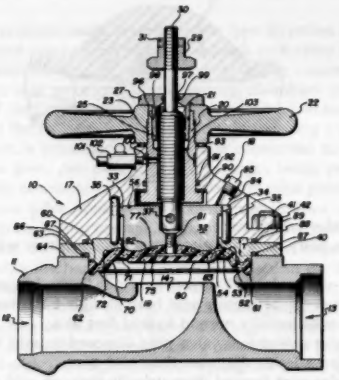
an opening formed axially in said sealing member between said second mentioned cylindrical surface member and said bottom wall to define a fluid passage for communicating said clearance with said chamber thereby avoiding a pressure differential thereon tending to cause the sealing member to move into the passage as the plug is rotated to the closed position.

4,014,514

HIGH PRESSURE DIAPHRAGM VALVE

Werner K. Priese, Barrington, and Wayne David Hayes, Mt. Prospect, both of Ill., assignors to Hills-McCanna Company, Carpentersville, Ill.

Filed June 27, 1975, Ser. No. 591,175
Int. Cl.² F16K 7/16
U.S. Cl. 251—331 **15 Claims**



10. In a valve comprising a valve body defining inlet and outlet ports and a closure port communicating therewith, a valve bonnet fixed on the valve body over the closure port, a compressor reciprocable toward and away from the closure port, a flexible diaphragm overlying the closure port and movable by the compressor into engagement with the closure port to block fluid flow through the closure port and alternatively movable away from the closure port to permit progressively greater fluid flow through the closure port, the improvement comprising an annular limit plate secured between said valve bonnet and said valve body against which said compressor engages to limit movement thereof, said limit plate and said valve body including means to receive and retain an annular enlarged edge of said diaphragm, inwardly of the periphery of said limit plate, said limit plate including an annular extension which defines the periphery thereof, which extension is clamped between said valve body and said bonnet thereby to preclude rocking of said valve components, while firmly retaining said diaphragm in position.

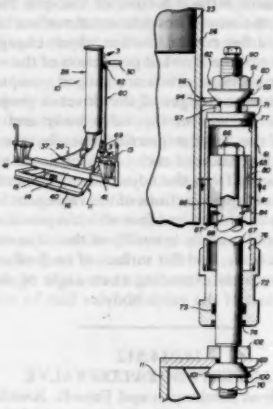
4,014,515

SNUBBER FOR ONE END LIFT JACKS

Richard S. Graafsma, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Filed Nov. 24, 1975, Ser. No. 634,923
Int. Cl.² B66F 3/24
U.S. Cl. 254—2 B **13 Claims**

1. A lifting jack operated by a gas comprising: a headed cylinder member, a piston slidable in the cylinder to define a closed chamber between the cylinder head and piston, a piston rod member attached to the piston for relative slidable motion at least partly into and out of the cylinder, and a snubber, comprising, in combination, a headed snubber cylinder affixed relative to one of the cylinder and piston rod members, a snubber piston slidable in the snubber cylinder to define a first closed chamber between the cylinder head and



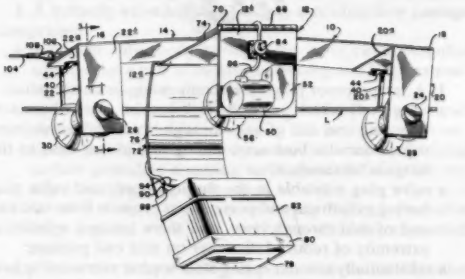
piston, the snubber including a first, selective, bleed port having a piston defining bleed port means in fluid communication with the closed snubber chamber, a snubber piston rod affixed relative to the other of the piston rod and cylinder members, and selective one way fluid flow check means cooperable with the piston bleed port, whereby fluid flow in one direction through the piston bleed port means is relatively free, and rapid fluid flow in the opposite direction through the bleed port means is relatively inhibited.

4,014,516

SPAN TROLLEY

Kenneth R. Jacks, 2117 Ruby, Irving, Tex. 75060

Filed May 6, 1976, Ser. No. 683,731
Int. Cl.² H02G 1/02
U.S. Cl. 254—134.5 **10 Claims**



1. A span trolley to move a cord between two points of suspension parallel to an existing line comprising: a chassis; a driven wheel; means rotatably securing the driven wheel to the chassis; means to drive the driven wheel; a pair of guide wheels; means rotatably securing the guide wheels on opposite sides of the chassis; resilient means adapted to urge the guide wheels upwardly against the line such that the line is urged against the driven wheel; means attaching a cord to the carrier such that as the driven wheel is rotated the carrier moves along the line to draw the cord from a first point of suspension of the second point of suspension of the line.

4,014,517
VARIABLE HEIGHT STAND

Walter S. Keagle, Collins, Iowa 50055

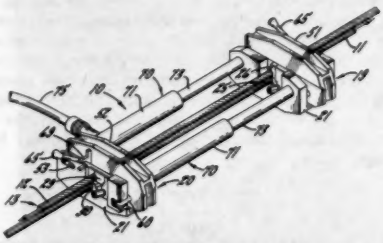
Filed Dec. 10, 1975, Ser. No. 639,450
Int. Cl.² B66F 7/26; F16M 11/00
U.S. Cl. 254—45 22 Claims

1. A stand for support of a structure, comprising:
a generally flat base;
at least three symmetrically orientated, linear legs extending generally upward from the base;
a support platform supportively engageable with a part of the structure;
a first end of each leg being pivotally assembled to the support platform for rotation about a horizontal axis with respect to the platform;
assembly means movably assembling a second end of each leg to the base positioning said second ends on the base so that the legs extend from the base to the platform in converging relationship toward said platform, the second end of each leg being slidably movable on the base in a first direction toward one another to move the platform away from the base, and a second direction away from one another to move the support platform toward the base;
said assembly means including guide means on the base to guide movement of the second end of each leg in said first and second directions; and
releasable lock means to releasably secure the second end of each leg from movement on the base.

4,014,518
CABLE TENSIONING DEVICE

Ellsworth W. Lapp, c/o Lapp Engineering 6060 S. 11th St., Rockford, Ill. 61109

Filed Feb. 23, 1976, Ser. No. 660,368
Int. Cl.² B66F 1/00
U.S. Cl. 254—69 4 Claims

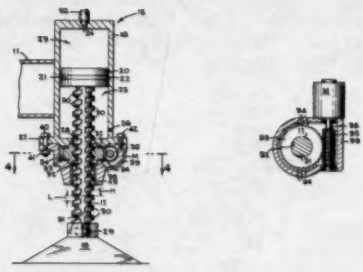


1. A device for tensioning a cable having first and second lapped end portions, said device comprising first and second members spaced from one another along said cable, a plurality of reversible linear actuators spaced symmetrically around said cable and connected to said members for changing the spacing between said members, said first and second members having first and second cable-receiving openings, respectively, each adapted to accept said first and second cable end portions, means attached to and movable in unison with said first and second members and disposed within said first and second openings for gripping and pulling said first and second cable end portions, respectively, and thereby tension the cable when said actuators are actuated to change the spacing between said members, said gripping and pulling means in one of said openings retaining its grip on the gripped cable end portion and substantially retaining the latter in its pulled position when said actuators are reversed and reversely change the spacing between said members, said device further including means within said one opening for automatically gripping the other cable end portion and substantially retaining the latter in its pulled position when said actuators are reversed, and mechanism for enabling the gripping and pulling means in the other opening to be released from the gripped cable end portion whereby the spacing between said members may be changed reversely to enable said cable end portions to be again gripped and pulled upon the next actuation of said actuators while substantially retaining the previous tension placed in said cable.

4,014,519
HYDRAULIC JACK WITH MECHANICAL LOCKING DEVICE

Theodore M. Leigh, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 30, 1976, Ser. No. 653,877
Int. Cl.² B66F 3/16
U.S. Cl. 254—86 H 9 Claims



1. In a jack of the type having a cylinder, a piston slidably received within the cylinder, and a piston rod projecting from the piston outwardly of the cylinder, the improvement comprising a worm wheel nut that is threadedly engaged upon the piston rod, a rotatable worm that is engaged with the worm wheel nut, and a motor to rotate the worm, said worm wheel nut being held at a fixed location relative to the cylinder but being rotatable about the piston rod to enable the rod to travel axially of the cylinder said cylinder being a single acting hydrualic cylinder and the threads between the piston rod and the worm wheel nut having a helix angle that is greater than the angle of friction so that in response to loading thereon the worm wheel nut will rotate on the piston rod to enable retraction of the rod within the cylinder.

4,014,520
RAILING ASSEMBLY AND METHOD

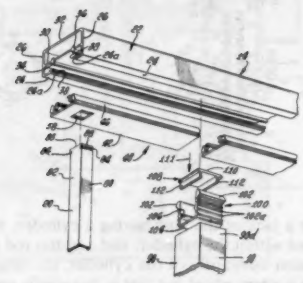
Donald H. Walters, 493 Stanford Drive, Arcadia, Calif. 91006

Filed Dec. 22, 1975, Ser. No. 643,363
Int. Cl.² B21F 27/00; E04H 17/14
U.S. Cl. 256—22 18 Claims

1. A grid structure, said structure comprising
a. a top rail assembly, said assembly including
i. an inverted U-shaped channel member of a predetermined length and fabricated of a rigid but resilient material, said member having a top wall, a pair of sidewalls joined to and extending down from the top wall, the lower portion of each of said sidewalls being bent over at a right angle toward the other sidewall thereby to be spaced from the top wall by a firt predetermined distance, with the edges of both said bent over portions being spaced from each other by a second predetermined distance edge, and a pair of down-

wardly extending rails integral with the top wall, spaced from each other by said second predetermined distance, said rails having altitudes less than said first predetermined distance and being disposed in vertical alignment with said sidewall edges; and

ii. a U-shaped channel member constituting a locking cover plate of a predetermined extent, of a width slightly greater than said second predetermined distance, and comprising a bottom wall and a pair of sidewalls joined to and extending upwardly from said bottom wall for approximately said first predetermined distance, the outer sides of said sidewalls being slightly convexed to arch towards each other, and longitudinal recesses being provided along the lines of joinder of said bottom wall and said sidewalls, said recesses being located and configured to receive the inwardly extending edges of the bent over portions of the sidewalls of the inverted U-shaped channel member; and said sidewalls further having flanges inwardly extending towards each other, but spaced from each other by a third predetermined distance, each of said flanges being capped by an L-shaped receiving channel element with the open side facing the open side of the other corresponding L-shaped channel element; the said bottom wall being orificed at predetermined spaced locations, said orificing being of a polygonal configuration with two opposite sides of the polygon being parallel to each other and to the sidewalls of said U-shaped channel



member, and said opposite sides being disposed in each instance in vertical alignment with the open sides of said L-shaped receiving channel elements;

b. a bottom rail, said bottom rail comprising an inverted U-shaped rigid channel element of the same predetermined length as said locking cover plate of the top rail assembly and having a top wall from the side edges of which extend downwardly a pair of sidewalls, said top wall being orificed to the same polygonal configuration as the orificing in the planar bottom wall of said locking cover plate and with the same spaced locations, said sidewalls each having a pair of flanges spaced from the top wall and from each other and extending towards the corresponding flange on the opposite sidewall, the flanges more proximate to said top wall having angular opposed projecting edges, the last said edges being spaced from each other by substantially the same distance as separates the said hooking projections in the open sides of said L-shaped receiving elements in said locking cover plate; and the flanges most remote from said planar top wall extending inwardly towards each other further than the other flanges, thereby to provide a pair of shelves inwardly of said angular opposed projecting edges of the other flanges; and said bottom rail being disposed parallel to said top rail assembly in rectangular alignment therewith and spaced therefrom by a predetermined distance;

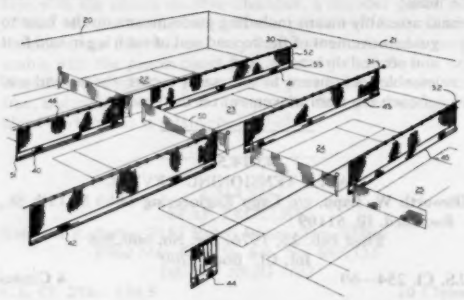
c. a plurality of rigid elements, each of said elements having a polygonal cross section corresponding to the orificing in both said locking cover plate of the top rail assembly and said top wall of said bottom rail, and extending through both of said orificings to where, in the case of the bottom rail, the end of said element rests on the pair of shelves provided by said most remote flanges; and in the case of the top rail assembly the end of said element seats in said L-shaped receiving channel elements in said locking cover plate; and said locking cover plate being inserted, with the ends of said elements so disposed in said L-shaped receiving channel elements, between the spaced edges of the lower portions of the sidewalls of the inverted U-shaped channel member of the top rail assembly to where the upper edges of its sidewalls seat against its top wall and abut the opposing faces of said rails, and said spaced edges seat in said longitudinal recesses; each of said rigid elements being grooved slightly inwardly from each of its ends transversely along the sides which, in the case of the top rail assembly seat in said L-shaped channel receiving elements and, in the case of the bottom rail, seat on said shelves; and upon both such seatings, said hooking projections in said L-shaped channel receiving elements, and said opposed angular edges of the bottom rail, enter said grooves, thereby locking said rigid elements within the top rail assembly and within said bottom rail respectively to prevent withdrawal therefrom.

4,014,521

DIVIDER NET WITH REPLACEABLE BOTTOM PANEL

Alan M. Berman, 949 Sutton Drive, Northbrook, Ill. 60062

Filed Sept. 29, 1975, Ser. No. 617,418
Int. Cl.[2] E04H *17/00*; A63B *61/00*
U.S. Cl. 256—1 **16 Claims**



1. A divider net having an upper portion and an easily replaceable lower panel, means for attaching the lower panel to the upper portion by fasteners, whereby said panel may be replaced on site, preferably without having to remove the upper portion from its support, and an additional plurality of means for periodically binding the upper portion to the panel at spaced points distributed along substantially the entire length of the nets where they are joined together by said attaching means.

4,014,522

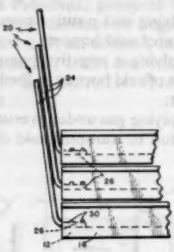
PERMANENTLY FIXED END RAILS ON TELESCOPIC BLEACHER SEATS

David L. Sutter, Kennebunkport, Maine, assignor to Hussey Manufacturing Company, Inc., North Berwick, Maine

Filed Nov. 17, 1975, Ser. No. 632,401
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—59 **5 Claims**

1. A telescoping bleacher stand comprising a plurality of sections arranged to be stacked for storage in a vertical column, one above another, and for movement therefrom to an open position in which they are extended from one another in stepped relation, and a free-standing guard rail fixed to each end of each section so that it stands upwardly therefrom and inclines outwardly relative to the end of the section to which

it is fixed so that when the sections are moved from their extended positions to their stored positions, the guard rails at



the ends of the stacked sections will nest one within another in spaced, parallel, noninterfering relation.

4,014,523

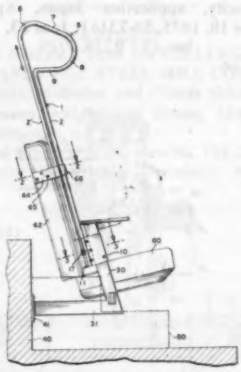
ARENA AISLE RAILING

Arthur J. Reader, 293 Pepperidge Road, Hewlett Harbor, N.Y. 11557

Continuation-in-part of Ser. No. 577,378, March 14, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 640,313

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **6 Claims**



1. An arena aisle railing for connection to the frame of an arena seat comprising:

a bracket including an extension and having thereon means for attaching said bracket to the frame of the arena seat; and

a U-shaped longitudinal bar having a pair of leg portions and a base defining a loop for gripping at a top thereof, said bar being longitudinally adjustably mounted in said bracket, the cross section of said longitudinal bar being oval; and

said bracket forming a cooperating oval surface in which said longitudinal bar is mounted.

4,014,524

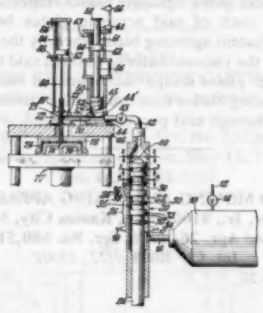
DISPERSING APPARATUS

Ward John Klingebiel, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 487,250, July 10, 1974, abandoned, which is a division of Ser. No. 42,316, June 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 704,639, Feb. 12, 1968, abandoned. This application Nov. 19, 1975, Ser. No. 633,361

Int. Cl.² B01F *7/26, 13/10*

U.S. Cl. 259—6 **4 Claims**



1. Apparatus for dispersing a low viscosity fluid throughout a high viscosity polymer-containing mass comprising: conveying means for continuously passing a gross pre-mixture of said high viscosity polymer-containing mass and said lower viscosity fluid in simultaneous co-current flow to and in a single direction through mixer means having a cylindrical barrel and a plurality of spaced, commonly-rotatable dispersion discs positioned therein as alternately-spaced perforated and solid rotating discs; said perforated discs providing first mixing zones through their perforations and having outer edge surfaces in close rotating clearance with the inner walls of said barrel; said solid rotating discs having their outer edge surfaces spaced from the inner walls of said barrel to there form second mixing zones wherein said fluid is mixed after passage through said first mixing zones and is intimately dispersed throughout the polymer-containing mass when passed through said second mixing zones; said plurality of perforated and solid discs being arranged so that the first and last discs are perforated.

4,014,525

HORIZONTAL TYPE CONTINUOUS PUG MILL FOR HIGH VISCOUS MATERIAL

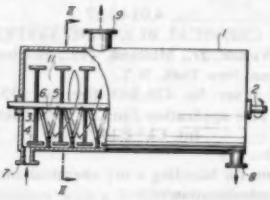
Chikao Oda, and Morihisa Maruko, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 22, 1975, Ser. No. 615,680

Claims priority, application Japan, Sept. 25, 1974, 49-109537

Int. Cl.² B01F *7/02, 9/00;* A21C *1/00;* A23G *1/00*

U.S. Cl. 259—9 **4 Claims**



1. A horizontal type continuous pug mill for a higher viscous

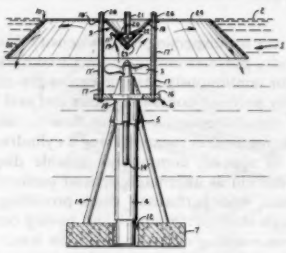
material comprising a body provided at its one end with an inlet nozzle for the material to be treated and at its other end with an outlet nozzle, a rotary shaft extending through said body and driven to be rotated, a plurality of spaced agitating blades secured to said rotary shaft and formed with through holes and means provided in spaces defined by said body and adjacent agitating blades to endow the material with feeding function in cooperation with said agitating blades, said means comprising a plurality of compressing plates provided at the upstream sides of the agitating blades respectively, the upper end of each of said plates being inclined towards the adjacent agitating blade, a plurality of scraping plates provided at the downstream sides of the agitating blades respectively, and the upper end of each of said scraping plates being inclined towards the adjacent agitating blade whereby the compressing plates squeeze the viscous material through said through holes and the scraper plates scrape said squeezed viscous material from said agitating blades thus causing the viscous material to be advanced through said pug mill.

4,014,526

LIQUID MOVING AND MIXING APPARATUS

Roy A. Cramer, Jr., 8100 Paseo, Kansas City, Mo. 64131

Filed Apr. 26, 1976, Ser. No. 680,519
Int. Cl.² B01F *7/22, 15/02*
U.S. Cl. 259—24 **15 Claims**



1. A liquid moving apparatus comprising:
a. a ballast member;
b. a frame structure mounted on said ballast member and extending upwardly therefrom and having an upper end portion;
c. a submersible motor mounted on said frame structure and positioned adjacent the upper end portion thereof;
d. a propeller rotated by said submersible motor to effect an upwardly directed flow in a body of liquid;
e. a diffusing member mounted on said frame structure and positioned above said propeller, said diffusing member being cone-shaped to diffuse the flow upwardly and outwardly; and
f. a deflector member mounted on said frame structure and positioned above said diffusing member, said deflector member having a top wall and a side wall extending outwardly and downwardly from said top wall to deflect the flow outwardly and downwardly.

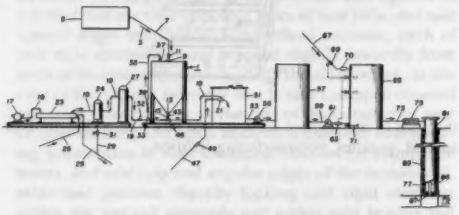
4,014,527

CHEMICAL BLENDING SYSTEM

Wilson D. Watson, Jr., Midland, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 426,843, Dec. 20, 1973, Pat. No. 3,902,558. This application Jan. 23, 1975, Ser. No. 543,394
Int. Cl.² B28C *5/06*
U.S. Cl. 259—151 **7 Claims**

1. A system for blending a dry chemical and a liquid comprising, the combination of:
a. a hopper adapted for receiving and feeding said dry chemical, said hopper being adapted for having a positive pneumatic pressure applied thereto and for maintaining therein said positive pneumatic pressure;
b. a conduit communicating with a lower portion of said hopper;
c. a means for applying said positive pneumatic pressure to an upper location of said hopper;
d. a means for applying a negative pneumatic pressure to the lower portion of said hopper to feed said dry chemical into said conduit;
e. a means for supplying gas under pressure to an upstream end of said conduit to transport said dry chemical;



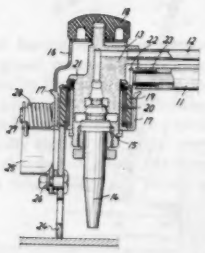
f. a means for dehumidifying said gas connected into sid conduit upstream of said hopper;
g. a means for forming a free-falling sheet of liquid;
h. a means for supplying liquid to said means for forming a free-falling sheet of liquid; and
i. a means for directing the flow of said gas and said dry chemical from the downstream end of said conduit into a free-falling sheet of liquid formed by said means for forming a free-falling sheet of liquid to blend said dry chemical and said liquid.

4,014,528

GAS CUTTING MACHINE

Noboru Sugiyama; Yoshitugu Watanabe, and Hiroshi Yamamoto, all of Tokyo, Japan, assignors to Koike Sanso Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1975, Ser. No. 639,711
Claims priority, application Japan, Apr. 22, 1975, 50-48162; June 18, 1975, 50-73161; June 23, 1975, 50-75464
Int. Cl.² B23K *7/10*
U.S. Cl. 266—66 **5 Claims**



1. A gas cutting machine for cutting a steel plate comprising, a motor, a transmission axis connected to said motor, a first gear connected to said transmission axis, a device head having a gas cutting nozzle, a second gear mounted around said device head and rotatable in a horizontal direction by rotation of said first gear, a driving wheel rotatable in a vertical direction and adapted to move along the steel plate to be cut, a bracket means for supporting said driving wheel adjacent to said gas cutting nozzle whereby the driving wheel is pressed against the lower surface of said second gear for rotation thereby, control means for actuating said motor and transmission axis, and pipe means for supplying oxygen preheated, preheated oxygen, and fuel gas to said gas cutting nozzle.

4,014,529

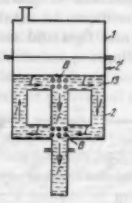
DEVICE FOR VACUUM-REFINING OF MOLTEN METAL

Leonid Petrovich Puzhailo, pereulok Kremenetsky, 5a, kv. 2; Vitaly Petrovich Polischuk, prospekt Vernadskogo, 85, kv. 122, and Viktor Konstantinovich Pogorsky, ulitsa Poligraficheskaya, 24a, kv. 247, all of Kiev, U.S.S.R.

Filed Jan. 15, 1975, Ser. No. 541,143

Int. Cl.² C21C 7/10

U.S. Cl. 266—210 16 Claims



1. A device for vacuum-refining of molten metal, comprising: a vacuum chamber; an electromagnetic pump disposed under said vacuum chamber to feed metal thereinto; an annulus-section line of said electromagnetic pump composed of central and side portions and communicating with said vacuum chamber; a metal feed pipe line for feeding metal into said vacuum chamber, said metal feed pipe line communicating with said annulus-section line; a metal discharge pipe line for discharging metal from said vacuum chamber, said metal discharge pipe line being connected from below to the central portion of said annulus-section line of said electromagnetic pump; said electromagnetic pump further comprising two inductors, each having an electric coil and a closed magentic circuit embracing said side portion of said annulus-section line and a third inductor having electric coils with an open magnetic circuit of which the gaps are disposed in the areas of communication between said central portion and said side portions of said annulus-section line.

4,014,530

PROTECTIVE NOZZLE FOR METALLURGIC VESSELS, PARTICULARLY FOR STEEL MILL CONVERTERS

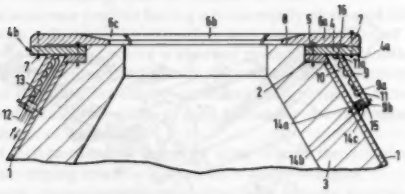
Karlheinz Langlitz, Mulheim, and Günter Schmitz, Duisburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed July 23, 1976, Ser. No. 708,225

Claims priority, application Germany, Aug. 1, 1975, 2534331

Int. Cl.² C21C 5/46

U.S. Cl. 266—241 3 Claims



1. A protective nozzle for metallurgic vessels such as steel mill converters, comprising

a. a vessel shell;

b. a frontal ring connected to the end face of said vessel shell opening;

c. a plurality of semi-annular nozzle ring segments forming an annular nozzle ring; the improvement characterized by

d. a solid annular supporting ring disposed between said frontal ring and said annular nozzle ring, said supporting ring supporting said segments;

e. said supporting ring extending radially beyond said vessel shell to form an annular radial extension;

f. an annular shield depending from said supporting ring and spaced from said vessel shell to form a hollow space therebetween;

g. cooling water circulation means disposed in said hollow space, said circulation means connected to said shield; and

h. means for attaching said segments to said annular radial extension, said attaching means being accessible at the bottom surface of said supporting ring.

4,014,531

TUNDISH FOR THE CONTINUOUS CASTING OF STEEL

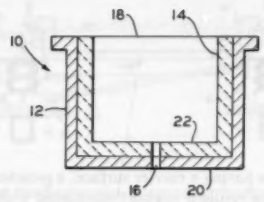
Masaru Takashima, Komae, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1975, Ser. No. 572,012

Claims priority, application Japan, May 15, 1974, 49-53194

Int. Cl.² F27D 1/00

U.S. Cl. 266—280 4 Claims



1. A tundish for the continuous casting of steel characterized by having an inner lining of a moulding which comprises from 50 to 80 percent by weight of a siliceous refractory, based on silicic anhydride, having a particle size less than 100 mesh, from 2 to 10 percent by weight of a refractory clay, from 8 to 20 percent by weight of a refractory fibrous material, and (d) from 4 to 10 percent by weight of an organic binder, with the surface of said molding which is adapted to be in contact with molten metal being impregnated with at least one material selected from the group consisting of colloidal silica, water glass, aluminum phosphate, a suspension of zircon sands, a suspension of alumina, and a suspension of silicic anhydride.

4,014,532

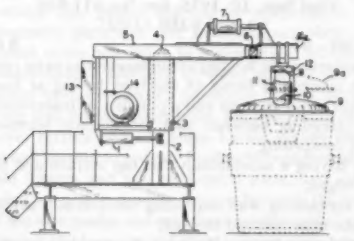
LADLE REFRACTORY LINING PREHEATER

Carl A. Holley, 116 Marian Ave., Glenshaw, Pa. 15116

Filed Jan. 2, 1976, Ser. No. 646,407

Int. Cl.² F27B 14/00

U.S. Cl. 266—287 4 Claims



1. In combination with a ladle having an inner lining of refractory material, a preheater for uniformly heating said lining prior to introduction, into the ladle, of molten metal,

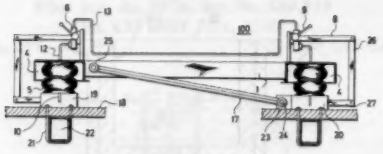
comprising a ladle cover having a burner for projecting a flame into the cover in the direction of the ladle lining to preheat said lining, a vertical flue extending into the ladle cover for exhausting fumes developed therein, a boom including a horizontal pivot for pivotally suspending said cover and burner so that the cover will automatically remain in a horizontal plane irrespective of both lifting and lowering movements, and means for pivoting said boom in a vertical direction to effect selective lifting and lowering movements of said cover, means for effecting lateral movements of said boom about a vertical axis, throughout which movements said cover will always extend in a horizontal plane to enable tightly closing of said ladle by said cover.

4,014,533

RESILIENT LOAD-BEARING SUPPORT FOR A VEHICLE

Oldrich Krejcir; Miroslav Bures, and Alois Jerábek, all of Liberec, Czechoslovakia, assignors to Vysoka skola strojni a textilni, Liberec, Czechoslovakia

Filed July 11, 1975, Ser. No. 595,180
Int. Cl.² F16F *5/00*
U.S. Cl. 267—120 **10 Claims**



1. In a vehicle having a carrier surface, a position-controllable, load-bearing resilient support associated with the carrier surface and substantially isolated from forces imparted to the carrier surface during the movement of the vehicle, the support comprising, in combination, a stiff frame, a plurality of independently and externally adjustable pneumatic springs individually interconnecting spaced portions of the frame to respectively underlying portions of the carrier surface for maintaining each of said frame portions in a continually selectable vertical position relative to the underlying carrier surface portion in accordance with the amount of fluid in the springs, means coupled to the frame and operable independently of the springs for limiting vertical displacements of the springs during movement of the vehicle, and means including at least one arm extending between a first predetermined frame portion and the carrier surface portion underlying a second predetermined frame portion spaced from the first predetermined frame portion for oscillating the frame about the last-mentioned carrier surface portion.

4,014,534

CHAIN REPAIR WORKBENCH

Melvin J. Ahlquist, Sioux City, Iowa, assignor to City of Sioux City, Iowa, Sioux City, Iowa

Filed Sept. 10, 1975, Ser. No. 611,986
Int. Cl.² B25B *11/02*
U.S. Cl. 269—47 **9 Claims**

1. An apparatus for holding chain assemblies to be repaired, the chain assemblies being of the type having at least two longitudinal chain sections and a plurality of transverse chain sections extending between said longitudinal sections, the apparatus comprising

a table having a substantially flat top surface and parallel side edges;

a first upstanding wall extending transversely across said surface near one end thereof;

means for supporting said first wall on said top surface;

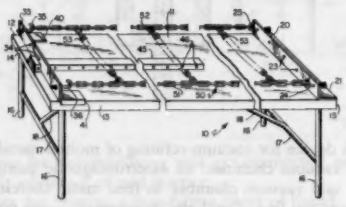
first hook means attached to said first wall at transversely spaced apart locations for engaging one end of each of the longitudinal chain sections;

a second upstanding wall;

guide means fixedly attached to said second wall for engaging the side edges of said table and for movably retaining said second wall for longitudinal movement along said surface while maintaining said second wall substantially parallel to said first wall;

second hook means attached to said second wall for engaging the other ends of the longitudinal chain sections, said second hook means being attached at locations spaced apart by a distance substantially equal to the spacing of said first hook means; and

means for locking said second wall at any one of a plurality of longitudinal positions to establish a predetermined spacing between said first and second walls, said means for locking including



a bar extending longitudinally on said top surface from one end thereof parallel to said side edges,

said bar having means defining a plurality of openings at longitudinally spaced intervals;

means in said second wall defining an opening therethrough dimensioned to mate with said bar;

a flange attached to and movable with said second wall along said bar, said flange being adjacent said opening in said second wall and having an opening therethrough alignable with a selected one of said openings in said bar; and

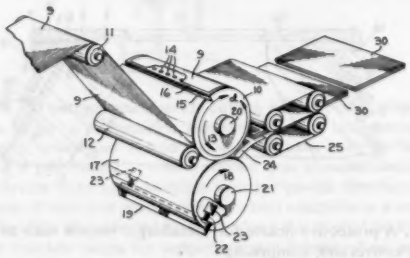
a locking pin insertable into said openings in said flange and said bar to establish a longitudinal position of said second wall.

4,014,535

CONTINUOUS SHEET COLLATING METHOD AND APPARATUS

Robert E. Kleid, Fairfield; Donald J. Ilik, Stamford, and Ferris Gene Keyt, Trumbull, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 585,849, June 11, 1975, abandoned. This application May 25, 1976, Ser. No. 689,956
Int. Cl.² B41F *13/64*
U.S. Cl. 270—19 **15 Claims**



1. A continuous sheet collating at least two discretely method for collating printed sheets which are initially printed on a web and subsequently cut from the web and collated, comprising the steps of:

a. feeding a continuous web of printed, sheet-like material

towards a continuously, uninterrupted rotating collating drum;

b. wrapping said web around the continuously rotating collating drum a number of times which is one less than a desired number of sheets to be collated, to provide a number of wraps of printed sheet;

c. severing the wraps of printed sheet disposed upon the rotating collating drum to provide the desired number of individual printed sheets while the collating drum continues to rotate;

d. selectively controlling the severing of the wraps, whereby severing of the wraps takes place at any desired number of rotations of the collating drum;

e. supplying one additional printed sheet from the web of material, and collating said additional sheet together with the desired number of individual printed sheets from the collating drum; and

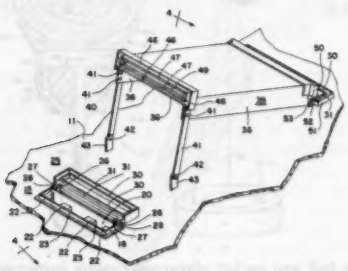
f. discharging said number of individual printed sheets from said rotating collating drum and said additional printed sheet from the web, as a unitized mass of collated printed sheets to provide a bundle of printed sheets in textual context.

4,014,536

FEEDING APPARATUS FOR X-RAY FILM AND THE LIKE

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Road, Willow Grove, Pa. 19090

Filed Aug. 18, 1976, Ser. No. 715,623
Int. Cl.² B65H *1/00*
U.S. Cl. 271—162 **6 Claims**



1. Apparatus for feeding film or the like to a processing machine which comprises

an entrance portion mounted on the top to the machine and communicating with the interior thereof,

said entrance portion having a horizontally elongated throat with a downwardly extending wall along side thereof and of a width to receive a sheet of predetermined width,

said throat along the opposite side thereof having a plurality of spaced downwardly extending wall portions of lesser width than the width of said throat for the reception of sheets of lesser width,

said wall portions on opposite sides of said throat being in converging relation toward their lower margins,

closure means movably mounted with respect to said entrance portion for selective disposition in a position in covering relation to said entrance portion or in a position permitting free access to said entrance portion, and

auxiliary means for disposition for supplying material in sheet form to said throat,

said auxiliary means comprising a plurality of enclosing walls providing a chute,

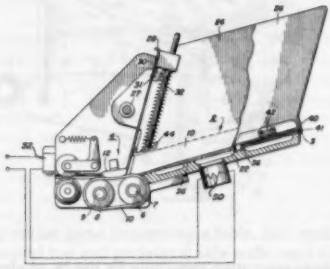
said chute having an end portion for engagement with said entrance portion.

4,014,537

AIR FLOATATION BOTTOM FEEDER

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,015
Int. Cl.² B65H *3/04, 3/48*
U.S. Cl. 271—166 **5 Claims**



1. A sheet feeding device adapted for feeding sheets individually from the bottom of the stack of sheets comprising:

means forming an air plenum adapted for connection to a source of pressurized air,

a sheet support plate associated with said plenum, said sheet support plate having a plurality of fine bores formed therein adapted for communication with the interior of said air plenum for passage of air from said air plenum through said bores, said bores terminating at the sheet support surface of said plate in sharp edged orifices, passage of air from said plenum through said bores producing jets of air adapted for penetration through the bottom sheet in the stack, passage of air through the bottom sheet in the stack causing the air jets to be diffused to provide an air cushion between the bottom sheet in the stack and the sheets immediately thereabove;

sheet feeding means mounted adjacent said sheet support plate adapted for contact with the bottom sheet in the stack for feeding the bottom sheet therefrom;

a front edge abutment plate associated with said sheet support plate, said abutment plate being spaced from said sheet support plate to allow passage of sheets separated from the stack to pass beneath said abutment plate;

adjustable side guides adapted for cooperation with said abutment plate and said sheet support plate, said side guides being adjustable to a plurality of positions to accommodate a plurality of sheet stack sizes, said side guides having outwardly projecting flanges thereon overlying said sheet support plate, the outer periphery of the lower surface of said flanges having sealing material attached thereto to provide fluid tight engagement between said flanges and said perforated plate, said side guides being formed to provide a space between the lower edge of the side guides and said sheet support plate, air passing through the bores in said sheet support plate beneath said flanges escaping from beneath said side guides into the sheet stack on said sheet support plate for riffling the lower sheets in the stack to increase the air cushion effect between the lower sheets in the stack.

4,014,538

SHEET SEPARATING DEVICE IN ELECTROSTATIC RECORDING APPARATUS

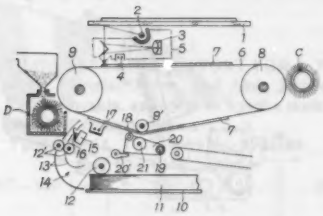
Mitsuo Akiyama, Higashi-Murayama, and Masamitsu Kasuya, Nagareyama, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,045

Claims priority, application Japan, Oct. 28, 1974, 49-124588

Int. Cl.² B65H *43/00*

U.S. Cl. 271—176 **2 Claims**



1. A sheet separating apparatus for use in an electrophotographic recording system of the type having a belt, means for driving the belt and a photosensitive surface carried by said belt, and means for feeding a transfer sheet into contact with said photosensitive surface, the improvement comprising:

a. a pair of rollers arranged on each side of said belt downstream of the transfer sheet feeding means, one of said rollers being movable from a first position spaced from the belt to a second position in contact with said transfer sheet, the movable roll when in contact with said sheet cooperating with the other said roll to separate said sheet from the photosensitive surface;

b. means for detecting the presence and absence of transfer sheet feed to said photosensitive surface, and

c. means for moving the said movable roll from said first position to said second position when the detecting means detect the presence of sheet feed.

4,014,539

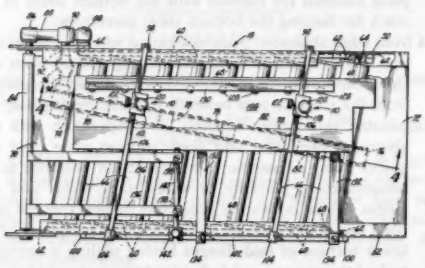
ANGULAR PATH SHEET CONVEYING

Eber Lyle Goodwin, Arlington Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 14, 1975, Ser. No. 601,008

Int. Cl.² B65H *29/20*

U.S. Cl. 271—184 **3 Claims**



2. A conveyor for receiving a sheet moving in a first direction and changing its motion to a second direction substantially normal to said first direction, comprising:

a. a frame including two longitudinal frame members;

b. an array of parallel, closely spaced rollers extending between said longitudinal frame members generally normal thereto but canted slightly in one direction;

c. power means for driving the rollers; and

d. sheet control and guide means cooperating with said rollers comprising:

1. overhead supports mounted on said frame and including at least one beam extending parallel to said rollers;

2. a guide plate and register bar supported on and depending from said beam and adjustable therealong, said guide plate having a raised sheet entrance portion;

3. a series of balls carried by said guide plate and register bar, each ball resting on one of said rollers to urge a sheet into driving engagement therewith; and

4. a second beam mounted on said overhead supports and extending along one side of the conveyor, and a sheet deflector mounted cantilever-fashion on said beam and extending towards said guide plate with its free end at a lower level than the raised entrance portion of the guide plate to guide incoming sheets therebeneath.

4,014,540

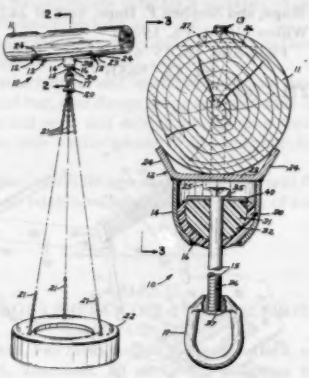
SWING MOUNT FOR PLAYGROUND EQUIPMENT

Ted L. Caulkins, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.

Filed Mar. 31, 1975, Ser. No. 563,775

Int. Cl.² A63B *31/00*

U.S. Cl. 272—85 **6 Claims**



1. A ball and socket playground swing suspension mount, comprising:

a. a member defining a socket having an aperture therein, said socket having an inner portion shaped substantially as a portion of the inner surface of a hollow sphere;

b. means for attaching said member to a swing support frame;

c. A ball positioned within the socket, said ball having a portion of its surface comprising a segment of a sphere, said segment having a shape and size to conform to said inner portion of said socket, and another portion thereof generally planar and positioned away from said aperture, said ball having a bore therethrough along an axis generally perpendicular to said generally planar side;

d. a load supporting bolt positioned within said bore having its head adjacent said generally planar side and its opposite and extending through said aperture in the socket, said opposite end being adapted for attachment to a playground swing; and

e. a retainer member, having a bore therein and positioned along said bolt between the head of said bolt and said generally planar side of said ball, said retainer member being dimensioned larger than said aperture to prevent said bolt from dropping through said aperture in case of breakage of the ball.

4,014,541
GOLF TEE

Armand J. Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

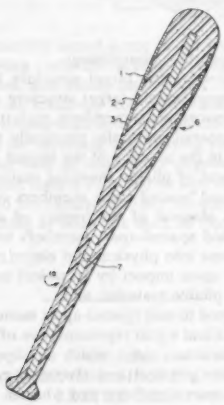
Filed Apr. 26, 1974, Ser. No. 464,390
Int. Cl.² A63B 57/00; C05C 9/02
U.S. Cl. 273—33 5 Claims

1. A golf tee consisting essentially of water-soluble thermoplastic hydroxypropyl cellulose having an M.S. of 2 to 10 and dispersed therein from about 1 to about 30% by weight, based on the weight of the golf tee, of a slow release nitrogenous fertilizer.

4,014,542
BAT USED IN BASEBALL

Yukio Tanikawa, No. 7203, Fukumitsumachi, Nishitonamigun, Toyama, Japan

Filed Mar. 14, 1974, Ser. No. 451,377
Claims priority, application Japan, Mar. 22, 1973, 48-32952
Int. Cl.² A63B 59/06
U.S. Cl. 273—72 R 6 Claims

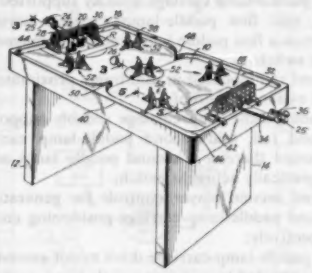


1. A bat used in baseball, said bat comprising:
a main member having a barrel portion for hitting a baseball and a grip portion joined to said barrel portion for holding the bat, said main member being formed from materials selected from the group consisting of urethane foam, wood, or a combination of urethane foam and wood;
a metal tubular portion having a plurality of openings therethrough fitted only around said barrel portion of said main member;
urethane foam foamed through the openings through said metal tubular portion joining said metal tubular portion to said barrel portion of said main member;
glass cloth surrounding said metal tubular portion and said main member; and
a coating of synthetic resin paint over said glass cloth.

4,014,543
AIR ACTION GAME

Avi Arad, New York, N.Y., assignor to Innovisions Enterprises, Inc., New York, N.Y.

Filed Dec. 9, 1975, Ser. No. 638,986
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 H 11 Claims

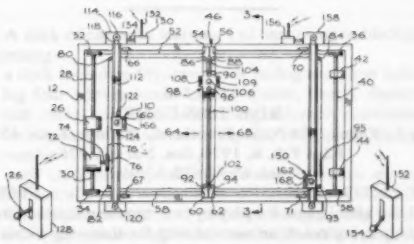


1. An air action game comprising a table, said table having a flat horizontal top and peripheral side walls, said side walls extending above the level of the table top, said table top being provided with opposed recesses adjacent the central portions of at least two opposed side walls, means to project air in a substantially horizontal stream from above each recess and across the upper surface of the table top, means to mount each air projecting means for rotation about an associated vertical axis, a plurality of clusters of vertical air stream rotated baffles disposed on the upper surface of said table top, means mounting each cluster for free rotation about an associated vertical axis when contacted by an air stream, and a low density game piece, said game piece being disposed on said table top whereby the projected air streams move said game piece about on said table top under the control of opposing players manipulating the directions of said streams, said game piece being from time to time blocked and trapped by a cluster and thereafter flung along the table top by the trapping cluster when the cluster is freely rotated by an air stream.

4,014,544
ELECTRIFIED AMUSEMENT DEVICE

Torazo Kimura, 1-8-10, Wakabayashi, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 581,908, May 29, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,827
Int. Cl.² A63F 9/00
U.S. Cl. 273—85 R 10 Claims



1. An electrified amusement device including:
a frame, said frame having first and second extremities;
ball-lamp carriage driving means;
a ball-lamp carriage mounted in said frame and coupled to said driving means for movement along a resultant path made up of simultaneous oscillatory motions of said carriage along first and second mutually perpendicular paths

throughout the period of operation of said amusement device, said ball-lamp carriage having a centrally mounted ball lamp and first and second magnets supported on said ball-lamp carriage on opposite sides of said ball lamp towards said first and second extremities of said frame;

a first rail mounted in said frame proximate to said first extremity thereof;

a first paddle-lamp carriage slidably supported on said first rail, said first paddle-lamp carriage having mounted thereon a first paddle lamp and a first magnetically actuable switch;

a second rail mounted in said frame proximate to said second extremity thereof;

a second paddle-lamp carriage slidably supported on said second rail, said second paddle-lamp carriage having mounted thereon a second paddle lamp and a second magnetically actuable switch;

first and second player controls for generating first and second paddle-lamp-carriage-positioning control signals, respectively;

a first paddle-lamp-carriage drive motor assembly mechanically coupled to said first paddle-lamp carriage and coupled to be responsive to said control signals from said first player control to position said first paddle-lamp carriage along said first rail;

a second paddle-lamp-carriage drive motor assembly mechanically coupled to said second paddle-lamp carriage and coupled to be responsive to said control signals from said second player control to position said second paddle-lamp carriage along said second rail;

said ball-lamp carriage having portions of said resultant path of motion proximate to said first and second rails;

a first electrical circuit including said first magnetically actuable switch;

said first magnetically actuable switch being responsive to said first magnet when said ball-lamp carriage is moving along one of said portions of said resultant path and said first paddle-lamp carriage is positioned adjacent said portion, to close said first electrical circuit;

a second electrical circuit including said second magnetically actuable switch;

said second magnetically actuable switch being responsive to said second magnet when said ball-lamp carriage is moving along one of said portions of said resultant path and said second paddle-lamp carriage is positioned adjacent said portion, to close said second electrical circuit; and

sounding means responsive to the closure of said first or said second electrical circuits to produce a sound representing the hitting of a ball by a paddle.

4,014,545

RING TOSS GAME

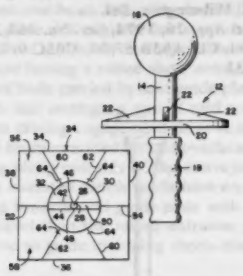
Roy L. Keim, 1156 N. St. Francis St., Wichita, Kans. 67214

Filed Feb. 6, 1976, Ser. No. 655,976

Int. Cl.[2] A63B *67/06*

U.S. Cl. 273—95 H **3 Claims**

1. An aerial game for play by two opposing teams comprising: a playing court; an annular ring for throwing within said playing court; a scoring zone at the center of said playing court; a pair of mutually exclusive regions on said playing court about said scoring zone for said respective opposing teams to throw said ring towards said scoring zone; a ring catching means for each member of said opposing teams comprising a shaft having a spherical head at an upper end of said shaft dimensioned for sliding passage through the inside diameter of said ring; a handgrip at a lower end of said shaft and a flange intermediate said upper and lower ends projecting radially of said shaft for supporting said ring when caught;



said spherical head comprising means for substantially centering said ring about said head during said passage.

4,014,546

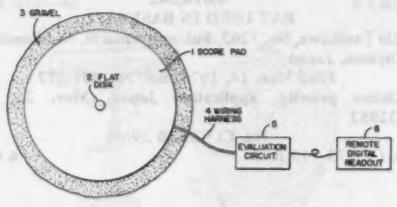
SCORING APPARATUS

Jeffrey H. Steinkamp, 1225 Maine St., Quincy, Ill. 62301

Filed May 29, 1975, Ser. No. 581,776

Int. Cl.[2] A63B *67/00*

U.S. Cl. 273—102.2 S **5 Claims**



1. A scoring apparatus comprising:

an elastically deformable target structure upon which an object is to impact, said target structure containing first and second spaced-apart members, each of which is made of pliable material, normally physically separated from one another in the absence of the impact of an object by a net-like sheet of pliable insulator material, capable of supporting said spaced-apart members relative to each other in the absence of the impact of an object while permitting said spaced-apart members to elastically deform and come into physical and electrical contact with one another upon impact by an object on either of said members of pliable material; and

means, connected to said spaced-apart members, for generating an electrical signal representative of the position on said target structure upon which an object impacts and thereby causes physical and electrical contact between said spaced-apart members; and wherein

said first member is a sheet of pliable material which is at least partially conductive,

said second member is a pliable sheet of partially conductive material, and

said means comprises

a first source of reference potential connected to a first selected location on said pliable sheet of partially conductive material,

a second source of reference potential connected to a second selected location spaced-apart from said first selected location on said pliable sheet of partially conductive material, thereby establishing a voltage gradient across said second member between said first and second spaced-apart locations,

a conductor connected to said pliable sheet of at least partially conductive material, and

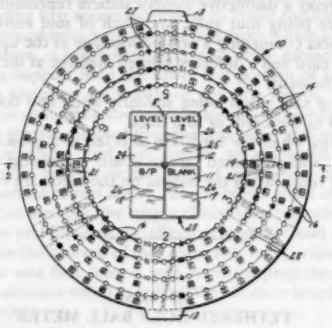
voltage conversion circuit means, connected to said conductor, for storing a voltage lying within said gradient supplied to said conductor in response to the impact of an object on said target structure and for converting said stored voltage to an electrical output representative of the distance between the position of impact of said object and one of said first and second selected locations on said pliable sheet of partially conductive material.

4,014,547

MATHEMATICAL BOARD GAME

Edward Gomez, and Charles Gomez, both of 2071 Union Blvd., Bayshore, N.Y. 11706

Filed Oct. 7, 1975, Ser. No. 620,296
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 C **9 Claims**



1. A mathematical board game to be played with playing pieces and playing cards comprising a circular playing board superimposed on, and axially interconnected with, a circular number board in relatively rotatable relation, said playing board being provided with integral holders in designated circular pathways for receiving said playing pieces, each holder being associated with an adjacently disposed opening alignable with viewable indicia disposed on said number board; and an integral card container centrally located on said playing board for receiving at least one deck of mathematical operation cards.

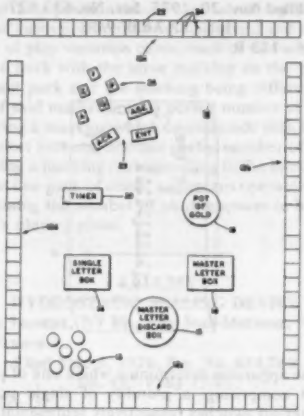
4,014,548

WORD GAME HAVING SINGLE AND MULTIPLE LETTER TILES

Minnie Hess Trilling, 21 E. Drive, Marvin Gardens, Margate, N.J. 08402

Filed Oct. 9, 1975, Ser. No. 621,155
Int. Cl.² A63F *3/00*
U.S. Cl. 273—135 D **7 Claims**

1. A word game comprising a first number of single-letter alphabetic tiles; a second number of multiple-letter alphabetic tiles; at least two discrete playing boards located in a playing area, each of said boards having a single row of letter spaces, one of said letter spaces being a multiple-letter space arranged to receive one of said multiple letter tiles and the remaining spaces being single-letter spaces, successive single-letter tiles placed in successive single-letter spaces and said multiple-letter tile placed in said multiple-letter space forming a word, the score value of said word corresponding to the length thereof with respect to said multiple-letter tile, wherein the score values corresponding to said single-letter spaces are printed on the playing boards at respective single-letter spaces, said



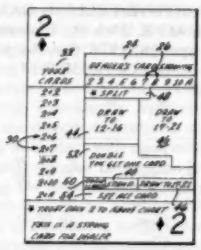
score values increasing in both of opposite directions with respect to said multiple-letter space.

4,014,549

BLACKJACK CARD DECK

Sigmund Cywar, 2196 Vista Grande, Vista, Calif. 92083

Filed Apr. 2, 1975, Ser. No. 564,265
Int. Cl.² G09B *19/22*
U.S. Cl. 273—152.41 **5 Claims**



1. A deck of cards for learning and improving in blackjack, comprising:

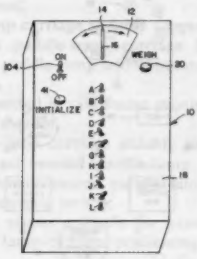
a. a deck including fifty-two cards having markings indicating four conventional suits of spades, hearts, diamonds and clubs and each suit having thirteen conventional serially ranking cards including ace, king, queen, jack and numbers ten to two, and

b. each card having printed thereon information arranged horizontally and vertically in correlating rows and files, the margins of said rows and files being serially marked, one with various card values and with indicia that these values are assigned to the dealer's card showing and the other being marked with the value of the player's card on which the information is printed plus the value of each other card that could be associated as the second card of the player, and at the intersecting areas of rows and files there being course of action indicia as to the action the player should take in blackjack, whether to stand, split, double or draw to some named level.

4,014,550
ELECTRONIC ODD BALL GAME

Orvin Wilcox, Box 3, Kapuskasing, Canada

Filed Nov. 20, 1975, Ser. No. 633,627
Int. Cl.² A63F 9/06
U.S. Cl. 273—153 R 4 Claims

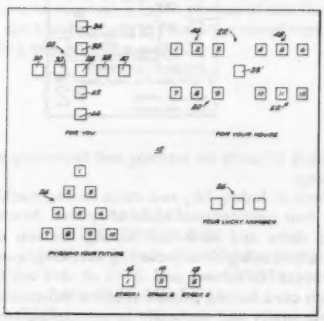


1. A game apparatus determining which one of plural items is different comprising: a plurality of single pole, double throw, center-off switches respectively representative of each of said items; each of said switches having a wiper associated with first and second contacts; random generator means coupled to said wipers for placing a first electrical signal on a random one of said wipers and a second electrical signal on each of the other wipers; electrical comparator means having two input terminals for receiving two input signals; said comparator means being configured for indicating whether said input signals are equal, and if not equal which is the greater in magnitude; first and second adder means respectively fed by each of said first and second contacts, each of said adder means having an output terminal; and means for coupling the output terminal of one of said adder means to one of said input terminals and for coupling the output of the other of said adder means to the other of said input terminals.

4,014,551
FORTUNE-TELLING GAME

Armando Alfonso, 417 E. 39th St., Hialeah, Fla. 33013

Filed Apr. 26, 1976, Ser. No. 679,897
Int. Cl.² A63F 9/18
U.S. Cl. 273—161 1 Claim



1. An amusement game comprising:

a gameboard having a game surface and indicia on the surface defining areas, a first area, a second area, a third area, a fourth area, and a fifth area,

the fifth area being composed of three separate indicia defining rectangular zones,

said first area being composed of a plurality of indicia defining rectangular zones arranged in a cross with a vertical line of five of said zones and a horizontal line of five of said zones with the middle zone of each line being common to both lines and an indicia in each of the zones of the cross except the middle zone designated by a numeral between one and eight in a predetermined order;

said second zone being composed of a plurality of indicia defining rectangular zones in a pattern composed of four groups of three zones equispaced from one another with each group being arranged in a line and with the groups radiating outwardly generally from a central zone defined by a rectangular outline and indicia on each of the zones of each of the groups designated by a numeral between one and twelve and arranged in a predetermined order;

said third area comprising ten indicia defining rectangular zones with each of the zones being arranged in a pattern defining a pyramid of zones, said pattern being composed of ten zones; and

said fourth area comprising three indicia defining rectangular zones in a line,

said gameboard comprising a selection board; and

a plurality of forty cards of similar size, each having an upper end and a lower end and each of said cards being arranged in a deck and each of said cards displaying thereon a distinctive symbol indicia representing a suit, there being four suits, and each of said cards carrying indicia comprising a printed message at the upper end of the card and a different printed message at the lower end of the card,

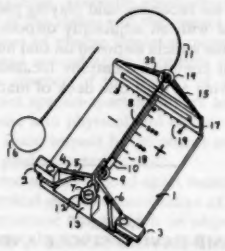
each of said zones being similarly sized and congruent to that of the cards of said deck,

whereby when the cards are selected in a prescribed fashion, and positioned on the board, a message or reading will result when the indicia on the cards are read.

4,014,552
TETHERED GOLF BALL METER

Thomas Arthur Watts Knott Watson, Box 546 Mount Royal Post Office, Montreal P.Q., Canada (H3P 3C7)

Filed Oct. 20, 1975, Ser. No. 624,271
Int. Cl.² A63B 69/36
U.S. Cl. 273—185 C 1 Claim

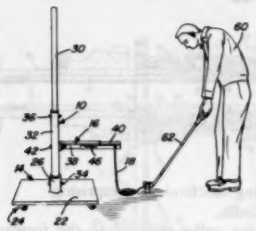


1. A tethered golf ball distance and angular measuring device comprising, a tether having one end attached to a golf ball, a horizontal rod pivoted at one end about a verticle axis, said rod having an eyelet at its other end remote from the pivoting point, said tether threaded through the eyelet, said tether's other end attached to a distance measuring means, means for indicating the angular position of the rod, a first elastic cord and a second elastic cord threaded through the eyelet, and the elastic cords mounted in a substantially horizontal plane perpendicular to the rod, the elastic cords threaded through the eyelet in a manner such that they cross over inside the eyelet, wherein the axis which is perpendicular to the eyelet and runs through the center of the eyelet is inclined away from the horizontal and passes through an imaginary upward extension of the rod's pivoting axis.

4,014,553
COMBINED GOLF BALL TETHER AND ANCHOR STRUCTURE

Minoru Sakamoto, 3911 Nioi Place, Honolulu, Hawaii 96816

Filed Nov. 24, 1975, Ser. No. 634,654
Int. Cl.² A63B 69/36
U.S. Cl. 273—200 R 10 Claims

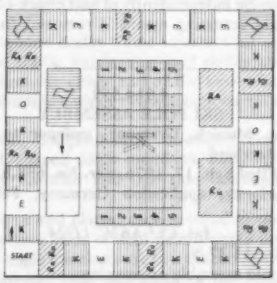


1. A golf ball tether structure comprising an upright standard including first means carried by its lower end for support of said standard from a support surface from which a golf ball may be driven, a low horizontally outwardly projecting arm stationarily support from the lower end portion of said standard at an elevation spaced above said first means, said arm including an outer free end portion spaced outwardly of said standard a greater distance than the spacing of said outer free end portion above said first means, an elongated flexible tether member having one end thereof anchored to the outer free end portion of said arm, a ball anchored to the other end of said tether member, the length of said tether member being at least one and one-half the effective length of said arm and greater than the spacing of said outer free end portion of said arm above said first means, said standard projecting above said arm a distance equal to at least the effective length of said tether member.

4,014,554
BOARD GAME APPARATUS

Gottfried Krummacher, Friedrich-Gauss-Strasse 2, 5205 St. Augustin/Sieg-3, Germany

Filed Mar. 31, 1975, Ser. No. 563,391
Claims priority, application Germany, Apr. 17, 1974, 2418266
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 AD 7 Claims

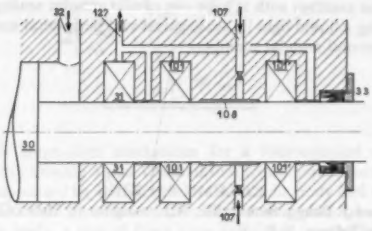


1. An instructional game for learning the interrelations of a free-market economy comprising a board having a closed circuit of individual serially arranged playing spaces, a plurality of playing pieces movable over said closed circuit, the individual playing spaces each having a marking with a number of different markings being provided for said playing spaces, a market area provided on the board and enclosed by said closed circuit of said playing spaces, said market area having a marking and being subdivided into a plurality of subsidiary areas, a plurality of counters sufficient to provide one said counter for each said subsidiary area, said counters being removably positionable on said subsidiary areas, at least one pack of cards positionable on said board and consisting of a plurality of play variation cards, each of said cards having a front and a back with the same marking on the backs of the cards in said pack and the marking being different from the marking of said market area, a partial number of the playing spaces having a marking which corresponds with the marking of said market area and another partial number of the playing spaces having a marking corresponding to the back marking of said at least one pack of cards, and means operable by a player for determining the number of playing spaces to be moved by the player's playing piece.

4,014,555
HYDROSTATIC SEALING DEVICE

Jean Louis Jacottet, 7/7 Bis, Rue Jean-Mermoz, 78 003 Versailles, France

Filed Feb. 3, 1976, Ser. No. 654,769
Int. Cl.² F16J 15/40
U.S. Cl. 277—3 16 Claims



1. In a hydrostatic sealing device which effects a seal by means of a high pressure acting upon surfaces which are in mutual contact and perform relative motions, said device comprising at least one segment split into a certain number of elements having lateral faces, said elements bearing against one another through flat surfaces contained in axial planes, when the contacting surfaces are cylindrical, and contained in mutually parallel planes when the contacting surfaces are flat, said elements being individually hydrostatically balanced, both in relation to the direction of relative motion between the surfaces which are in contact with each other, and in relation to the direction perpendicular thereto, an improvement characterized in that in the direction perpendicular to the direction of motion, that face of the element which is opposite to the surface that is in contact, is subjected to the action of a piston in communication with said high pressure whose area of contact with said opposite surface is isolated from the high pressure by a seal.

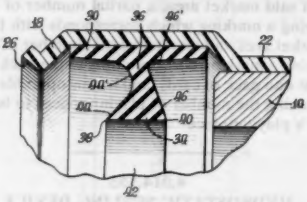
4,014,556
SEALING RING MEANS FOR PIPE COUPLINGS

Richard H. Anderson, Dover, Ohio, assignor to Clow Corporation, Oak Brook, Ill.

Filed Mar. 3, 1976, Ser. No. 663,255
Int. Cl.² F16J 15/10
U.S. Cl. 277—181 10 Claims

1. A sealing gasket for use in effecting a liquid tight seal between a first annular member and a second annular member adapted to be coaxially disposed within said first annular member in radially spaced relation therefrom, said gasket including an annular flange portion adapted to be secured to the inner peripheral surface of said first annular member, said gasket further having an annular sealing portion secured to and extending radially inwardly from said flange portion, said sealing portion having a substantially triangular transverse

section configuration when said sealing portion is in a relaxed condition, said sealing portion being secured to said flange portion at one corner edge of said substantially triangular section and defining a pair of resilient parallel annular sealing edges of substantially equal diameter, said gasket having a radial thickness greater than the radial spacing between said first and second annular members when disposed in said coax-



ial relation so that placement of said first and second annular members in said coaxial relation with said flange portion of said sealing gasket secured to the inner peripheral surface of said first annular member will effect resilient biasing of said sealing portion against the peripheral surface of said second annular member with at least one of said annular sealing edges forming a liquid tight lip seal against said peripheral surface of said second annular member.

4,014,557

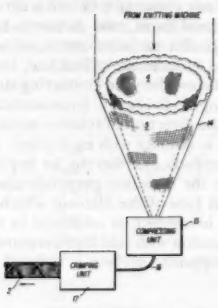
COLUMN PACKING

Edward J. Bragg, Somerville, N.J., assignor to Metex Corporation, Edison, N.J.

Filed June 4, 1975, Ser. No. 583,770

Int. Cl.² F16J *15/08*

U.S. Cl. 277—230 **6 Claims**



1. Column packing comprising a first layer and a second layer adjacent said first layer, each said layer comprising

an inner knitted flattened tubular mesh element formed of inner filaments and having 8 to 14 counts per inch,

an outer knitted flattened tubular mesh element formed of outer filaments, surrounding said inner element and in contact therewith and having 4½ to 6½ counts per inch,

the axes of said inner element and said outer element being substantially parallel or coincident,

at least one of said layers being crimped in wave form, the crests of said waves being at an angle of 20° to 45° to a line perpendicular to said axes,

a surface of said first layer being generally in contact with a surface of said second layer,

the diameter of said inner filaments being from 29 to 75% of the diameter of said outer filaments.

4,014,558

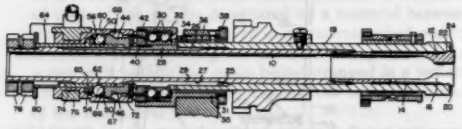
CHUCK-CLOSING MECHANISM FOR AUTOMATIC SCREW MACHINE

Earl W. Brinkman, Rochester, N.Y., assignor to Davenport Machine Tool Co., Inc., Rochester, N.Y.

Continuation of Ser. No. 491,308, July 24, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,518

Int. Cl.² B23B *31/20*

U.S. Cl. 279—50 **9 Claims**



1. A chucking mechanism comprising

an inner spindle,

a split tubular collet secured to the forward end of said spindle and having thereon a plurality of flexible, angularly spaced fingers, each of which has an external conical surface,

a chuck-closing spindle surrounding said inner spindle and collect and having an internal conical surface complementary to and engaging the external surfaces of said fingers, and

means for moving said chuck-closing spindle axially on said inner spindle in a direction to move said collet fingers to clamping position, comprising

an annular ball cage axially slidable on said inner spindle rearwardly of said chuck-closing spindle and operatively connected to said chuck-closing spindle coaxially thereof,

said cage having in one end a plurality of arcuate pockets of substantially semi-cylindrical configuration angularly spaced about the axis of said inner spindle, and extending radially through the annular wall of said cage about axes which intersect the axial centerline of said cage at right angles,

a plurality of balls movably mounted in said pockets for limited movement radially of said cage, and

actuating means removably mounted on said one end of said inner spindle in engagement with said balls and operable to transmit motion through said balls and said cage to said chuck-closing spindle, and in the direction to move said collet fingers to clamping position,

the radii of said pockets and said balls being approximately equal, whereby each ball contacts the surface of its associated pocket along an arcuate line, and

said ball cage being removable from said one end of said inner spindle independently of said chuck-closing spindle, when said actuating means is removed from said inner spindle.

4,014,559

SKI POLE ASSEMBLY

Peter Funke, Munich, Germany, assignor to ISPOW AG, Chur, Switzerland

Filed Feb. 17, 1976, Ser. No. 658,834

Claims priority, application Germany, Feb. 20, 1975, 2507352

Int. Cl.² A63C *11/24*

U.S. Cl. 280—11.37 N **15 Claims**

1. A ski pole assembly comprising:

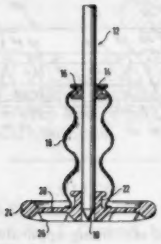
a. an elongated pole member having a longitudinal axis, an axial main portion, and an axial free end portion shaped for axially penetrating a snow surface;

b. a snow engaging member formed with an aperture axially extending therethrough for movably receiving a portion of said pole member,

1. said snow engaging member having a snow engaging face transverse to said axis and directed axially away from said main portion;

c. an axially compressible, resilient tubular mounting member having two axially terminal parts,

1. said terminal parts being annular about said axis and being fastened to said pole member and to said snow engaging member respectively, whereby said snow engaging member is secured to said pole member for relative axial movement between an operative position and a rest position of said snow engaging member,



2. said end portion projecting from said face in the operative position of said snow engaging member,

3. said snow engaging member in said rest position covering said free end portion,

4. said mounting member biasing said snow engaging member toward said rest position.

4,014,560

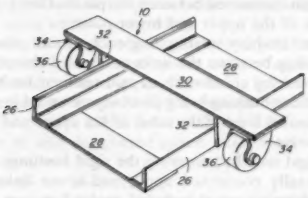
TRAFFIC BARRICADE DOLLEY

Robert L. Hughes, 24 White Birch Drive, Stockholm, N.J. 07460

Filed Apr. 8, 1976, Ser. No. 675,042

Int. Cl.² B60P *3/40*

U.S. Cl. 280—47.13 R **1 Claim**



1. A symmetrical dolley frame structure for use in the local movement of traffic barricades; said dolley structure being capable of receiving either end of the base of a traffic barricade or the abutting ends of two adjacent barricades, comprising:

two parallel, longitudinally oriented, complementarily paired, L-shaped angle members, each having one side vertically oriented and one side horizontally oriented inward;

two transverse end plates, each secured to and connecting the respective ends of said paired angle members, such that said angle members are in a spaced apart relationship slightly greater than the width of the base of a traffic barricade to be inserted therein;

two vertical plate members, one of each mounted mediately on the exterior side of the vertical portion of each of said angle members midway between the ends thereof, and extending upward from said angle members;

a horizontal plate secured to said vertical plates along the latitudinal axis of said dolley structure and extending beyond the exterior edges of said angle members, serving to divide said dolley structure into two symmetrical transit seats, each of which is capable of accommodating one end of the base of a traffic barricade;

at least one castor mounted to the underside of each end of said horizontal plate such that said castors extend below the horizontal plane of said transverse end plates and permit the movement of said dolley.

4,014,561

SUSPENSION MECHANISM FOR FOUR-WHEELED VEHICLE

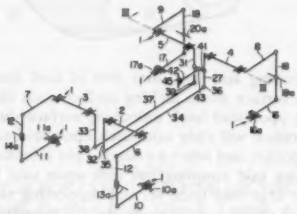
Ryuichi Tomiya; Koji Kaki, both of Sagamihara, and Yoshitomo Tezuka, Hachioji, all of Japan, assignors to Aida Engineering Kabushiki Kaisha, Sagamihara, Japan

Filed Mar. 12, 1976, Ser. No. 666,379

Claims priority, application Japan, June 27, 1975, 50-90076

Int. Cl.² B60B *19/02*

U.S. Cl. 280—104 **6 Claims**



1. A suspension mechanism for a four-wheeled vehicle body, comprising a pair of horizontal front torsion bars rotatably supported by a front part of the vehcile body and aligned in a direction transverse to the front-to-rear direction of the vehicle body, a pair of front arms extending forwardly of the vehicle body and secured to the transversely outer ends of the front torsion bars, respectively, said front arms carrying front vehicle wheels, respectively, a pair of front vertical arms having their upper ends secured to the transversely inner ends of the front torsion bars, respectively, a pair of horizontal rear torsion bars rotatably supported by a rear part of the vehicle body and aligned in a direction transverse to the front-to-rear direction of the vehicle body, a pair of rear arms extending rearwardly of the vehicle body and secured to the transversely outer ends of the rear torsion bars, respectively, said rear arms carrying rear vehicle wheels, respectively, a pair of rear vertical arms having their upper ends secured to the transversely inner ends of the rear torsion bars, respectively, a pair of links extending in said front-to-rear direction and having their front ends pivotally connected to the lower ends of said front vertical arms and their rear ends pivotally connected to the lower ends of said rear vertical arms, respectively, and a transversely extending lever pivotally supported at its middle part by the vehicle body and pivotally connected at its both ends to intermediate parts of one of said pairs of the front and rear vertical arms.

4,014,562

COUPLING HOOK FOR A THREE-POINT CONNECTION ON A TRACTOR

Dieter Kunze, Siegburg, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Jan. 30, 1976, Ser. No. 654,001

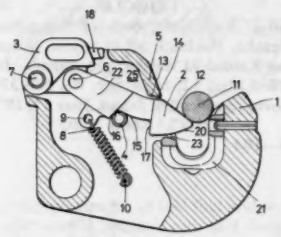
Claims priority, application Germany, Mar. 11, 1975, 2510490

Int. Cl.² B60D *1/10*

U.S. Cl. 280—508 **4 Claims**

1. A coupling hook for a three-point connection on a tractor comprising a hook body portion and a jaw extending therefrom to define a jaw opening for receiving a coupling pin on an implement and the like, said hook body portion having a

pocket therein and an opening in said pocket, an operating lever pivotally mounted in said pocket, a latch within said pocket having one end pivotally connected to said operating lever and its other end extending through said pocket opening toward said jaw, said latch having open and locked positions with respect to a coupling pin in said jaw opening, a supporting pin within said pocket and said latch having a first supporting surface pivotable and slidable on said pin, said latch having a second supporting surface engagable with an edge of said



pocket opening and the other end of said latch having an unlocking surface and a locking surface such that a coupling pin acting upon said latch unlocking surface during the coupling operation will slide said latch upon said supporting pin into said pocket and when a coupling pin is locked within said jaw opening said coupling pin acts upon said latch locking surface to urge said latch second supporting surface against said pocket opening edge to produce a moment acting upon said latch and operating lever urging said latch into said jaw opening.

4,014,563

RUN-AWAY PREVENTING DEVICE FOR SKIS

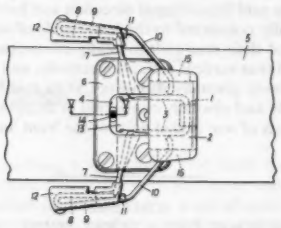
Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, both of Austria, assignors to Gertsch AG, Baar, Zug, Switzerland

Filed Dec. 10, 1975, Ser. No. 639,385

Claims priority, application Austria, Mar. 7, 1975, 1803/75

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **7 Claims**



1. In a run-away preventing device for a ski having a bar with brake legs supported on said ski, said bar being movable automatically under spring action into a braking position wherein said brake legs project downwardly from said ski on opposite sides thereof, the improvement comprising a holding plate secured to said ski and a stepping plate pivotally secured to said holding plate, said bar having two extensions extending from each of said brake legs, one of which is pivotally supported on said holding plate and thereafter extends to said stepping plate and the other extension extends directly to said stepping plate.

4,014,564

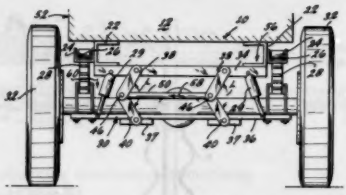
VEHICLE STABILIZING APPARATUS

Ralph A. Coble, San Diego, Calif., assignor to Coble Incorporated, San Francisco, Calif.

Filed Oct. 16, 1975, Ser. No. 623,057

Int. Cl.² B60G *19/02*

U.S. Cl. 280—689 **5 Claims**



1. Improved lateral stabilizing apparatus for a surface supported vehicle having a sprung frame and body portion attached thereto and an unsprung wheel and axle surface contacting portions comprising:

an upper support bar attached to said frame transversely thereof,

a lower support bar attached to said axle parallel to said first bar,

suspension and vertical dampening means connected between said sprung and unsprung portions,

two upper pairs of links connected to the upper bar, the pairs being spaced along the bar,

the links of each pair being parallel and pivotally connected to the respective forward and rearward sides of the bar,

two lower pairs of links connected to the lower bar, the lower pairs being spaced along the lower bar,

the links of each lower pair being parallel and pivotally connected to the respective forward and rearward sides of the lower bar,

a pivot pin connected between the parallel links of each pair of one of the upper and lower pairs,

a resilient bushing surrounding each of said pivot pins and extending between the links connected thereby,

a rigid bushing about each of said resilient bushing,

said resilient bushing being pivotally mounted in openings in the parallel links of the other of the upper and lower pairs respectively,

and a rigid member securing the rigid bushings together,

the pivotally connected upper and lower links of all the pairs forming equal included angles between them.

4,014,565

SAFETY BELT INSTALLATION FOR MOTOR CAR

Walter Fieni, Paris, France, assignor to Societe Anonyme Francais du Ferodo, Paris, France

Filed Aug. 21, 1974, Ser. No. 499,291

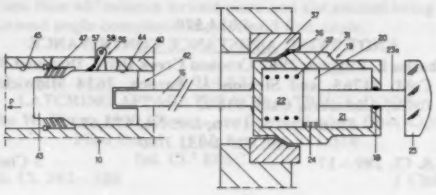
Claims priority, application France, Aug. 24, 1973, 73.30777

Int. Cl.² B60R *21/10*

U.S. Cl. 280—744 **11 Claims**

1. An installation to protect an occupant of a motor vehicle in case of a collision of said vehicle, said installation comprising a deformable vehicle structure, at least one strap type safety belt, means for anchoring said belt at its ends to said vehicle structure, a movable mechanical connection between one of said anchoring means and a part of said vehicle structure which is deformed upon said vehicle undergoing a collision, said mechanical connection being adapted to tension said belt when it is moved in a predetermined manner in response to a collision deforming said vehicle structure, and means for sensing collisions as to their force, said sensing means being connected to said mechanical connection to

prevent movement thereof in said predetermined manner when the force of a collision is less than a predetermined



value, said sensing means comprising at least one elastic member disposed between a fixed part of the vehicle and a part of said mechanical connection.

4,014,566

POCKET-SIZED CHECKBOOK

Sally H. Cantrell, and Bob I. Cantrell, both of P.O. Box 724, Newport, Oreg. 97365

Continuation-in-part of Ser. No. 520,661, Nov. 4, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,965

Int. Cl.² B41L *1/20*

U.S. Cl. 282—8 R **3 Claims**

1. A compact, pocket-sized checkbook assembly adapted for recording a check-writing transaction automatically while a check is being written comprising:

a. a plurality of checks of elongate rectangular shape, having identically positioned spaces on the respective faces thereof designated as spaces for writing information, each said designated space having indicia printed on the face of the respective check indicating the information to be written in said designated space, said checks being detachably connected in a vertically-offset, overlapping relation to one another;

b. a flap underlying said checks having one edge to which said checks are detachably connected, said vertically-offset checks being arranged such that each successive check in a downward sequence partially underlies its predecessor;

c. a record sheet, having a plurality of vertically-arranged spaces on the face of said sheet, detachably connected at one edge thereof to an edge of said flap other than said edge where said checks are connected such that said respective spaces on said record sheet are alignable in underlying relation to the respective designated spaces on the faces of said plurality of checks and such that said record sheet may be selectively inserted between different respective pairs of successive checks and selectively detached from said flap, each said space on the respective faces of said checks which is designated for the writing of information being located below the top edge of the next underlying check;

d. duplicating means associated with said checks for reproducing the images written in said respective designated check spaces on respective ones of said spaces of said record sheet; and

e. a register-type pocket-sized checkbook cover of generally rectangular shape foldable along a central line running from the top edge of said cover to an opposite bottom edge thereof so as, when folded, to form a closed cover of elongate shape having its longitudinal dimension extending between top and bottom, connecting means disposed upon said cover and adjacent said one edge of said flap for connecting said plurality of checks to said cover, at least a portion of said connecting means being located adjacent an outside edge of said cover which is parallel to said fold line, said detachable connection of said checks along said one edge of said flap being adjacent said outside edge of said cover such that the longitudinal dimension of each said check crosses said fold line in a direction perpendicular thereto, said checks and record sheet respectively both being folded along said line for compact storage within said cover.

4,014,567

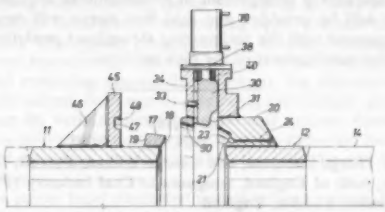
APPARATUS FOR COUPLING PIPE OR THE LIKE

James F. Arnold, Houston, Tex.; Glen E. Lochte, Asker, Norway, and Anthony B. Duncan, Missouri City, Tex., assignors to Hydro Tech International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 466,039, May 1, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,406

Int. Cl.² F16L *55/00*

U.S. Cl. 285—24 **16 Claims**



1. Apparatus for connecting the ends of a pair of pipes comprising:

a pair of coupling members, each mountable at one end thereof to the end of one of said pipes;

one of said coupling members including, at the opposite end thereof, an annular outwardly extending flange having forward and rearward sides;

the other said coupling member including, at the opposite end thereof, a housing for receiving said flange in locking engagement therewith, said housing having a base mateable with the forward side of said flange in said locking position;

means axially spaced from said base for releasably tying said housing to said one coupling member to restrain said housing against radially outward movement when said flange is in locking engagement therewith;

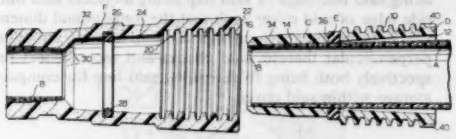
a plurality of cam members carried by said housing in said spacing between said tie means and base, said cam members being movable between a retracted position in which said flange is receivable by said housing and an extended position in which said cam members are engageable with the rearward side of said flange to drive the latter into locking engagement with said housing;

and means for moving said cam members between said retracted and extended positions.

4,014,568
PIPE JOINT

J. Warne Carter, Wichita Falls, and Martin Duane Neher, Burkburnett, both of Tex., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 462,574, April 19, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 662,081
Int. Cl.² F16L 35/00
U.S. Cl. 285—39 7 Claims

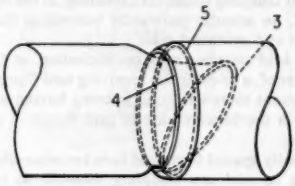


1. A joint for pipe comprising a first pipe section, a first sleeve surrounding and bonded to the end of the pipe section, a second sleeve on the pipe section rearward of the first sleeve, the second sleeve being externally threaded and having an internal diameter greater than the diameter of the pipe section, an elastomeric spacer ring surrounding the pipe section intermediate the sleeves, the first sleeve and spacer ring preventing removal of the second sleeve from said end of the pipe section, a second pipe section, and a collar bonded to and extending from an end of the second pipe section, the collar having an internally threaded portion adjacent the forward end thereof for engagement with said externally threaded second sleeve, the collar having a second portion rearward of the threaded portion adapted to receive the portion of the first pipe section having said first sleeve and spacer ring thereon, the second portion having an internal annular groove, and a sealing ring in the groove for engagement by said first sleeve, the first sleeve and said second portion of the collar having cooperable means whereby when the parts are connected a ball and socket arrangement of predetermined angular capability will be provided and said first sleeve will remain in engagement with the sealing ring throughout predetermined angular misalignment of the pipe sections.

4,014,569
FLEXIBLE DUCTING JOINT

Peter Thorp, Hampton, and George William Bycroft, Doncaster, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jan. 2, 1973, Ser. No. 320,552
Claims priority, application United Kingdom, Jan. 24, 1972, 03325/72
Int. Cl.² F16L 31/00
U.S. Cl. 285—260 5 Claims

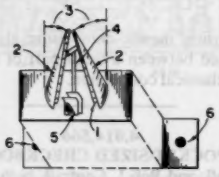


1. A length of flexible ducting having open ends, a pair of rings secured to a first one of the ends, a first of the rings being attached at an extremity of the first end of the ducting and the second of the rings being attached to the ducting parallel to the first ring and at a predetermined distance from said extremity of the first end, the first ring of the pair of rings having a smaller diameter than the second ring of the pair of rings, whereby the said predetermined distance is such that a resilient ring attached to an end of a second length of flexible ducting can be retained between said first and second rings when positioned therebetween.

4,014,570
KNOT TYING ASSISTANCE CONTRIVANCE

Charles F. Ruggles, 2982 Crooked Creek Drive, Diamond Bar, Calif. 91765, and Stenton A. Baruch, 2624 Midwickhill Drive, Alhambra, Calif. 91803

Filed Apr. 5, 1976, Ser. No. 673,653
Int. Cl.² D03J 3/00
U.S. Cl. 289—17 3 Claims

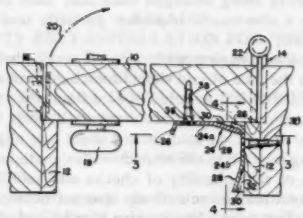


1. A device that permits an inner half knot of a granny, reef, square or like knot to be brought to tension and secured with an outer half knot when the ends of the outer half knot are pulled, and is a knot tying assistance contrivance of original type consisting of curved and tapering surfaces comprising a loop-separator structure means keeping half knots of granny, square, reef or similar knots untied; with a means for transferring tension from the pulled line ends through an outer half knot, through the loop formed around the loop-separator, through the inner half knot to the line around the item, with said means being connected to the loop-separator structure; having a means for controlling the size of the loop eye between the outer and inner said half knots with said means connected to said loop-separator structure; and having a means for releasing the combination of the half knots and the loop-structure with said means connected to the loop-separator structure, thereby tying the line as tensioned with said knots; whereby the knot tying assistance contrivance functions as an assistant for tying of the specified knots leaving a secured knot and a tensioned tied line.

4,014,571
LOCKING MEANS FOR DOORS AND WINDOWS

Rollo G. Ellis, 6409 War Eagle Lane, Charlotte, N.C. 28214

Filed Nov. 28, 1975, Ser. No. 636,135
Int. Cl.² E05C 19/00
U.S. Cl. 292—300 2 Claims



1. A locking device for a door or window disposed in a jamb and provided with hinging means having a removable pin, said device comprising a first plate mounted on said door or window proximate and opposite to said hinging means, a first angled end portion on said first plate, a second plate mounted on said jamb, a second angled end portion on said second plate engageable behind the first angled end portion of said first plate upon closure of said door or window for preventing said door or window from being removed from said jamb after

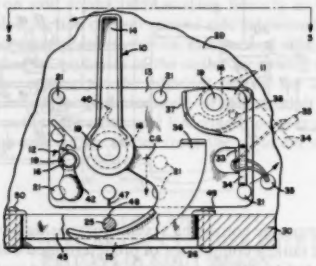
removal of said pin said first and second plates being identical and each having one of said angled portions on each end thereof, the first of said angled portions being at a first angle of less than 45° relative to said plate and the second being at a second angle complementary of said first angle.

4,014,572

LATCHING APPARATUS FOR A TRUCK DOOR

John W. Binns, 1010 Champagne Drive, Marion, Ohio 43302

Filed Dec. 1, 1972, Ser. No. 311,310
Int. Cl.² E05C *19/10*
U.S. Cl. 292—108 **1 Claim**



1. In a truck comprising an upwardly acting overhead door, a latch mounted on a support plate at the base of said door, and a catch pin mounted in the bed of said truck for engagement with said latch, the improvement wherein said latch comprises:

a latch bolt comprising an integral actuating arm and an integral hook and being pivotally mounted on said door whereby the weight of said latch bolt urges said hook self-adjustingly against said catch pin when said hook is in engaging relation therewith,

a keeper mounted on said support plate in position for abuttingly preventing disengagement of said hook from said catch pin, said keeper being pivotally movable from said position to another position whereby said disengagement is permitted, the rotation of said keeper from said position to said another position being limited by a stop peg mounted on said support plate and engageable with an arc shaped channel on the inner surface of the keeper, and

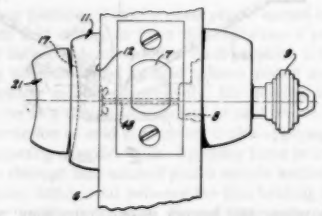
means for locking said keeper in said disengagement preventing position.

4,014,573

THUMBTURN AND ASSEMBLY AND METHOD OF PROVIDING A THUMBTURN

Hans F. Lehnhoff, Moraga, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Nov. 7, 1975, Ser. No. 629,881
Int. Cl.² E05B *1/00*
U.S. Cl. 292—347 **7 Claims**



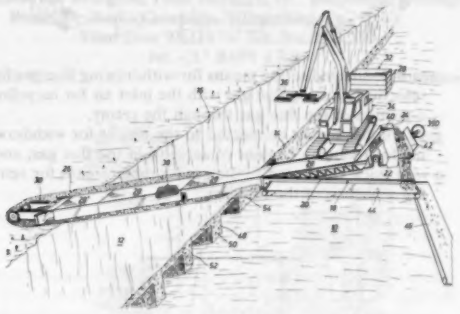
1. A thumbturn and assembly comprising a rose body including a hub concentric with an axis, including a face wall approximately normal to said axis, and including a bearing ring merging with said face wall and said hub and projecting axially from said face wall; a thumbturn including individual side walls disposed on opposite sides of said axis, including a pair of separate journal walls concentric with said axis, and including thrust walls merging with said side walls and said journal walls and facing said bearing ring; and means for transmitting force between said journal walls and said hub in a direction to urge said thrust walls toward said bearing ring.

4,014,574

MINING MACHINE HAVING RECTANGULAR THRUST TRANSMITTING CONVEYOR COLUMN

Robert E. Todd, Houston, Tex., assignor to Browning & Bushman, Houston, Tex.

Filed Apr. 10, 1975, Ser. No. 566,986
Int. Cl.² E21C *27/24, 29/02, 35/24*
U.S. Cl. 299—1 **29 Claims**



1. A mining machine comprising:

a cutting head including means for cutting an earth formation, the dimension of said cutting head from side to side being substantially greater than its vertical dimension;

a thrust-transmitting column connected to said cutting head and extending rearwardly therefrom, the dimension of said column from side to side being substantially greater than its vertical dimension, and said column having a non-thrust-transmitting column conveyor carried thereby and extending along substantially the entire length of said column;

and a power head connected to said column rearwardly of said cutting head and operative to thrust said cutting head forward into an earth formation by means of said column.

4,014,575

SYSTEM FOR FUEL AND PRODUCTS OF OIL SHALE RETORT

Gordon B. French, Rifle; William J. Bartel; Richard D. Ridley, both of Grand Junction, all of Colo.; Chang Yul Cha, La Verne, Calif., and Robert S. Burton, III, Grand Junction, Colo., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed July 26, 1974, Ser. No. 492,599
Int. Cl.² E21C *41/10*; E21B *43/00*
U.S. Cl. 299—2 **10 Claims**

1. An in situ oil shale retorting system comprising:

an active underground retort comprising a room in substantially undisturbed shale containing a bed of fragmented oil shale particles with a sufficient void volume distributed therethrough to permit gas flow;

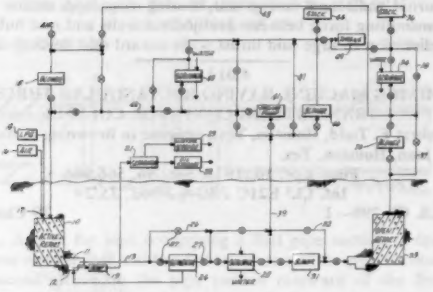
an air blower having an air inlet and an outlet connected to the top of the active retort for forcing air downwardly therethrough and sustaining a combustion zone in the retort;

a sump at the bottom of the active retort for collecting oil and water from the retort;

separator means connected to the sump for separating oil and water;

means for withdrawing flue gas from the bottom of the active retort;

separator means connected to the means for withdrawing flue gas from the retort for separating entrained oil or water from the flue gas;



means connected to the means for withdrawing flue gas for selectively mixing flue gas with the inlet air for recycling a portion of the flue gas through the retort;

gas scrubber means connected to the means for withdrawing for reducing content of aerosols in the flue gas; and

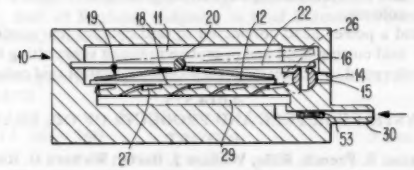
a vent stack connected to the gas scrubber means for venting a portion of the flue gas.

4,014,576

ARTICLE CARRIER

William O. Druschel, Granite Springs; Bayard G. Gardineer, Jr., Patterson; Stanley A. Manning, Yorktown Heights, and Bela Musits, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1975, Ser. No. 588,530
Int. Cl.² B65Q 51/02
U.S. Cl. 302—31 **12 Claims**



1. A device for supplying an article to and receiving an article from an air slide or the like including:

a portable carrier having a chamber in which the article is supported;

means to detachably connect said carrier to the air slide;

said carrier having means to receive pressurized air to selectively move an article between said carrier and the air slide when said detachably connecting means connects said carrier to the air slide;

said receiving means including an air slide base in said chamber, said air slide base receiving pressurized air to support the article in suspended relation within said chamber when the article is to be moved into or out of said carrier;

said chamber having a port;

means to seal said port;

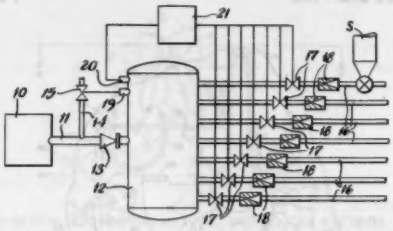
and means to prevent said sealing means from being rendered ineffective unless said detachably connecting means has connected said carrier to the air slide.

4,014,577

PNEUMATIC CONVEYING SYSTEMS

James Roger Clancy, and Kenneth Cook, both of Stockport, England, assignors to Henry Simon Limited, Cheshire, England

Continuation-in-part of Ser. No. 489,470, July 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 311,242, Dec. 1, 1972, abandoned. This application Mar. 1, 1976, Ser. No. 662,867
Int. Cl.² B65G 53/66
U.S. Cl. 302—35 **7 Claims**



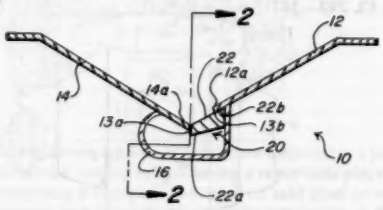
1. A pneumatic conveying system comprising a compressed air storage tank, a compressor of predetermined output capacity connected to deliver compressed air to said tank, a plurality of separate output conveying lines connected to said tank, means for supplying to each of said lines materials to be conveyed, an air nozzle in each line having convergent and divergent wall forms upstream and downstream respectively of a nozzle throat for maintaining substantially constant mass flow rate of air through said nozzle, a valve in each said line connecting same to said tank, and control means for selectively opening and closing each of said valves, the lines being sufficient in number that if all of said valves were open at the same time, the pressure required to meet the collective air volume demand thereof would be greater than can be provided by said compressor, further means being provided for sensing a condition when a plurality of said lines are operating such that introduction of a further line could cause the capacity of said compressor to be exceeded, and for transmitting a signal accordingly to said control means to prevent the valves in further of said lines from being opened until at least one of said operative lines becomes inoperative.

4,014,578

VARIABLE METERING DROP VALVE

Charles N. Grott, St. Louis, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed June 24, 1975, Ser. No. 589,942
Int. Cl.² B65G 53/46
U.S. Cl. 302—52 **34 Claims**



1. A pneumatic hopper outlet comprising: spaced outlet slope sheets inclined downwardly toward each other; said outlet slope sheets being spaced from one another at the lower ends thereof to define a discharge opening; side sheets joining

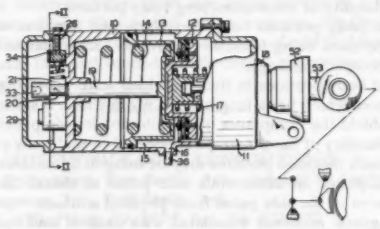
said outlet slope sheets at opposite sides of said outlet; an outlet conduit engaging the lower portion of each of said outlet slope sheets and said side sheets; a rigid valve member including valve portions on each side of the outlet located within said conduit and being movable within said conduit in a generally vertical direction; said valve member in one position engaging the lower ends of said outlet slope sheets and closing the discharge opening entirely across said outlet; said valve member being movable to a plurality of open positions to unload said outlet, and being movable to a closed position on a first side of the outlet and to a plurality of open positions on a second side of the outlet opposite to said first side, while said valve member is maintained in the closed position on the first side of the outlet; the extent to which said valve member is opened on said second side varying linearly to the extent that the valve portion on said second side is lowered from said ends of said outlet slope sheets on said second side; operating means located on each side of the outlet for raising and lowering the valve portion on the adjacent side of the outlet; and translating means located externally of said conduit extending across the outlet for raising and lowering the valve portion on the opposite side of the outlet from the adjacent side of the outlet.

4,014,579

SPRING ACTUATED BRAKE CYLINDER WITH RELEASE PISTON LOCKOUT MEANS

Claude Jacque Dubois, Paris, France, assignor to WABCO Westinghouse GmbH, Freinville-Sevran, France

Filed Dec. 17, 1975, Ser. No. 641,596
Int. Cl.² B60T *13/22*
U.S. Cl. 303—3 **10 Claims**



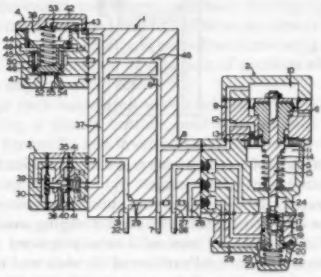
1. A brake cylinder device for railway type vehicle brakes, said brake cylinder device comprising:
   a. a casing;
   b. a release piston reciprocably disposed in said casing;
   c. a piston rod connected to said release piston;
   d. force generating means acting on and biasing said release piston for exerting an emergency brake-applying force in one direction;
   e. second piston means reciprocably disposed in said casing in axially aligned and oppositely facing relation to and abuttingly engageable by said release piston for transmitting said emergency brake-applying force in said one direction;
   f. said release piston and said second piston means cooperating with said casing to form therebetween a pressure chamber subjectable to variable fluid pressure acting on opposing pressure areas of said release piston and said second piston means, respectively, for moving said release piston in a direction opposite to said one direction in counteraction to said emergency brake-applying force and for exerting a service brake-applying force in said one direction through said second piston means according to the resultant differential between the two braking forces;
   g. a locking member pivotally disposed in said casing in transverse relation to said piston rod and biasingly engageable, upon movement of said release piston to a release position in a direction opposite to said one direction in response to fluid pressure in said pressure chamber at a certain high degree, with a groove formed in said piston rod for locking said release piston and piston rod against axial movement in a locked position coinciding with said release position and in which said emergency brake-applying force is neutralized during service brake-applying action effected by fluid pressure at a degree less than said certain high degree; and
   h. unlocking means operable responsively to subsequent restoration of fluid pressure to said certain high degree for causing operation of said locking member to an unlocking position in which said release piston is freed for exerting said emergency brake-applying force.

4,014,580

EMERGENCY BRAKE VALVE DEVICE FOR RAILWAY VEHICLES

Robert J. Bridigum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

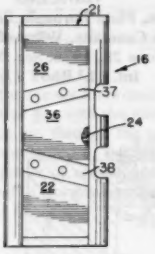
Filed June 28, 1976, Ser. No. 700,383
Int. Cl.² B60T *17/04*
U.S. Cl. 303—82 **7 Claims**



1. An emergency brake valve device for railway vehicles of a train having a brake pipe normally charged with fluid at a certain pressure and effective upon reduction of the fluid pressure therein for initiating a brake application on the train, said emergency brake valve device comprising:
   a. a source of fluid under pressure;
   b. a vent valve portion connected to the brake pipe and having therein a control chamber normally charged with the fluid pressure of said brake pipe and including vent valve means operable, in response to release of the fluid pressure from said control chamber, from a normally closed position to an open position for venting the brake pipe to atmosphere;
   c. a logic valve portion having therein an actuating chamber normally vented to atmosphere and including relief valve means communicating with said control chamber of said vent valve portion and operable, in response to charging of said actuating chamber with fluid pressure from said source, from a normally closed position to an open position for venting said control chamber to atmosphere; and
   d. a relay valve portion including differential pressure means and control valve means for effecting alternative communication of said actuating chamber of said logic valve portion with atmosphere or said source of fluid under pressure, said differential pressure means also having oppositely disposed pressure sides of different dimensions communicated in parallel relation to the brake pipe, the larger side being subjected to the brake pipe pressure unrestrictedly and the smaller side being subjected to the brake pipe pressure restrictedly through a choke member via which said brake pipe pressure may be equalized on said oppositely disposed pressure sides,
   e. said differential pressure means and said control valve means normally occupying, as a unit, an exhaust position in which said actuating chamber is cut off from said

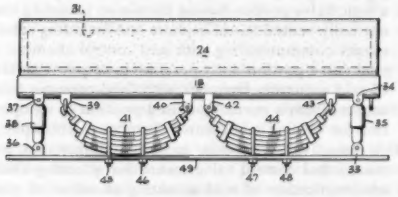
source of fluid under pressure and communicated with atmosphere, and being operable responsively to a pressure differential across the two pressure sides effected by a brake pipe pressure reduction at a rate exceeding the flow rate capacity of said choke member, to a supply position in which said actuating chamber is cut off from atmosphere and communicated with said source of fluid under pressure.

4,014,581
SHOE ASSEMBLY
Eugene R. Groff, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 14, 1975, Ser. No. 622,204
Int. Cl.² B62D *55/28*
U.S. Cl. 305—54 **8 Claims**



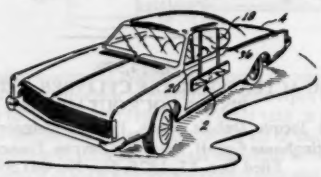
1. In a shoe of a continuous track of a crawler type vehicle, the improvement comprising:
a vibration damping assembly substantially covering a surface of the shoe, said vibration damping assembly having at least first and second laterally spaced apart plates extending over said surface of the shoe and a viscoelastic material positioned between and being bonded to said surface of the shoe and said plates for connecting the plates to the shoe, said first and second plates being separated one from the other by first and second intervening preselected areas for attaching links to the shoe.

4,014,582
VEHICLE BUMPER SYSTEM
Kenneth W. MacKenzie, 27945 Honeycomb Drive, Saugus, Calif. 91350
Filed June 30, 1975, Ser. No. 591,824
Int. Cl.² B60R *19/08*
U.S. Cl. 293—84 **4 Claims**



1. A bumper system and apparatus therefor to be carried on a chassis of a vehicle, the combination comprising:
an impact receiving member;
articulated resilient means mounting said impact receiving member to said chassis;
said articulated resilient means providing both hydraulic and spring shock absorption and said impact receiving member provides pneumatic shock absorption;
said impact receiving member is an elongated inflatable member and said resilient means includes a pair of leaf spring assemblies;
said impact receiving member further includes a pair of piston and cylinder assemblages separated by said leaf spring assemblies;
a holder releasably carrying said inflatable member and said articulated resilient means pivotally interconnecting said holder to said vehicle chassis; and
said inflatable member includes a carcass having a pair of grooves provided on opposite sides thereof adjacent an elongated bead and said holder includes a slot for slidably receiving said inflatable member whereby opposing edges of said holder defining said slot slidably engage with said grooves and said bead respectively.

4,014,583
AUTOMOBILE BUMP PROTECTOR
Arthur A. Forbes, 14030 Chadron, Apartment 116, Hawthorne, Calif. 90250
Filed Mar. 1, 1976, Ser. No. 662,526
Int. Cl.² B60J *11/00*; **B60R** *19/00*
U.S. Cl. 293—62 **16 Claims**

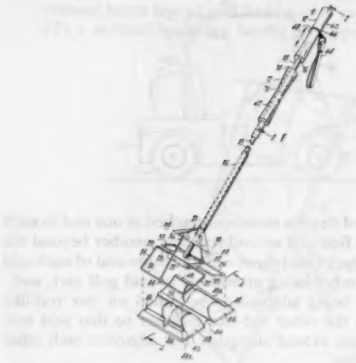


1. An automobile bump protector comprising:
a plurality of force-absorbing body portions;
said body portions being flexibly joined together with the portions being foldable relative to each other to form a compact package;
said body portions in their unfolded state providing a side area which has a length and a width which is sufficient to shield the bump area of an automobile side panel;
a plurality of hanger straps connected to said body portions such that said portions may be hung in an unfolded state adjacent an automobile side panel to shield the bump area of the side panel from physical contact;
magnetic members associated with each of said body portions, and
the magnetic members of adjacent body portions positioned to provide mutual attraction between adjacent body portions when the body portions are folded together to form a compact package,
whereby the body portions in an unfolded state while hung from an automobile by the hanger straps are attracted to a metallic automobile side panel by the magnetic members with a sufficient force to prevent shifting or dislodgment of the bump protector from the automobile by wind forces.

4,014,584
DEVICE FOR RETRIEVING ANIMAL WASTE
Marcel Bau, 89 Van Ness Court, Maplewood, N.J. 07040
Filed Nov. 24, 1975, Ser. No. 634,821
Int. Cl.² A47F *13/06*
U.S. Cl. 294—19 R **2 Claims**

1. Device for retrieving waste material comprising first tubular shaft having a distal handle end portion and a proximal end portion terminating in a first stop means, a second shaft concentrically disposed within said first shaft and extending outwardly of said proximal end portion and terminating in a second stop means, said second shaft being movable longitudinally with respect to said first shaft, a pair of opposed frame members each having a first transverse member rotatably attached to said second stop means and a second transverse

member pivotally attached to said first stop means said frame members being opposedly rotatable about said first transverse members upon longitudinal movement of said second shaft, longitudinal movement of said second shaft toward said proximal end portion causing said frame members to opposedly rotate to an open position wherein said frame members are mutually angularly displaced, longitudinal movemement of



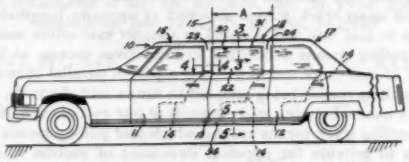
said second shaft toward said distal end portion causing said frame members to opposedly rotate to a closed position wherein said frame members are substantially adjacently positioned in which said first shaft terminates distally in a first-handle means and said second shaft terminates distally in a second-handle means positioned outwardly of said first-handle means, said first and second handle means comprising separate members.

4,014,585

AUTOMOBILE BODY CONSTRUCTION

Thomas P. Earnhart, Fort Smith, Ark., assignor to Armbruster/Stageway, Inc., Fort Smith, Ark.

Filed Aug. 19, 1975, Ser. No. 605,902
Int. Cl.² B60P 3/26
U.S. Cl. 296—16 **3 Claims**



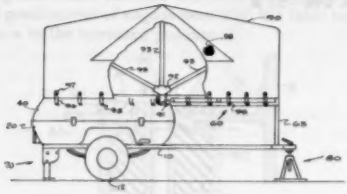
1. In combination with a passenger conveying, automobile body having a central side door opening therein bounded by longitudinally spaced apart, upstanding posts and a top body extending section having its end portions joined to the top end portions of the posts to define said opening, a door hinged to one said post and adapted to be latched to the other said post and closing the bottom portion of said central opening, a window glass mounted in the door for movement between open and closed positions in that portion of the central opening above said door, a continuous, inverted U-shaped weatherstrip positioned along the top body extending section and down the confronting faces of the door posts to the top portion of the door, the side portions of the weatherstrip continuously engaging and guiding the window glass, and the top edge of said door glass engaging the weatherstrip across the top body extending section when the glass is in closed position.

4,014,586

COMBINED TRAILER-CAMPER UNIT

Aubrey L. Swofford, Greenwood, S.C., assignor to Engineering Concepts, Inc., Greenwood, S.C.

Filed June 26, 1975, Ser. No. 590,640
Int. Cl.² B60P 3/34
U.S. Cl. 296—23 A **13 Claims**



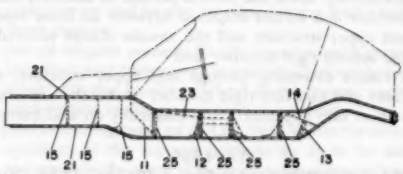
1. A trailer-camper combination comprising:
   a. a wheeled frame:
   b. a tongue secured to said frame and extending forwardly therefrom;
   c. a body secured to said frame, said body having a pair of mating sections cooperating to define an enclosure therebetween, a top section of said pair of sections being securable to a bottom section of said pair of sections along at least one edge thereof;
   d. a luggage rack associated with said body, said luggage rack having a planar bottom, said luggage rack being movable forwardly and inverted to provide a planar surface extension of the top section of said enclosure, and cooperating with said top section to define a floor for a camper system; and
   e. collapsible camper cover means erectable above said floor and securable around at least a position of the periphery of said floor to provide a habitable compartment atop said floor.

4,014,587

CAR PLATFORM STRUCTURE

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Oct. 8, 1975, Ser. No. 620,529
Int. Cl.² B62D 27/00
U.S. Cl. 296—28 F **8 Claims**

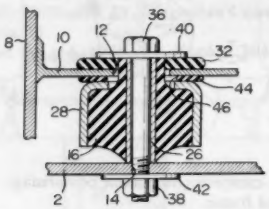


1. A car platform structure adapted to receive thereon a body balloon assembly, comprising in combination, plain open-sided main side sills of a length to extend past the wheel well zones, cross-members secured to the main side sills, a floor pan secured beneath the cross bearers, an auxiliary outer side sill of a length to be disposed in the door-passenger space between wheel-well zones secured to the outer sides of said main side sills, a plurality of longitudinally spaced transverse vertical baffles secured to the outer sides of said main side sills in the door-passenger zone between wheel well zones, and said outer auxiliary side sills being secured to said main side sills over said spaced baffles.

4,014,588
MOUNTING DEVICE FOR ELASTICALLY MOUNTING CAB

Yoshimasa Kohriyama, Machida, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Apr. 10, 1975, Ser. No. 566,870
Claims priority, application Japan, Apr. 15, 1974, 49-40999
Int. Cl.² B62D 23/00
U.S. Cl. 296—35 R 7 Claims



1. A mounting device elastically supporting an upper structure on a frame to isolate the transmission of vibratory energy therebetween comprising

a first elastic member having a hole formed axially therethrough, and including a generally cylindrical first portion and a generally cylindrical second portion, said second portion extending through a hole formed in said upper structure, and having a diameter less than that of said first portion and separated from said first portion by an annular shoulder portion,

a tubular first rigid member disposed within the hole formed through said first elastic member and being substantially co-extensive therewith axially,

a generally cylindrical second rigid member circumventing the first portion of said first elastic member and being substantially co-extensive therewith axially, a lower end of said second rigid member spaced-apart axially from said frame at a predetermined distance and a lower end of the second portion of said first elastic member extending axially therebeyond,

an annular flange secured on an upper end of said second rigid member and extending radially inwardly therefrom between the annular shoulder portion of said first elastic member and said upper structure,

an annular second elastic member disposed in circumventing relationship about the second portion of said first elastic member and further disposed on an outer side of said upper structure,

an annular third elastic member disposed in circumventing relationship about the second portion of said first elastic member and further disposed between an inner side of said upper structure and the annular flange secured to said second rigid member, and

bolt means extending through said upper structure, said frame and said first rigid member to thereby universally support said upper structure elastically on said frame.

4,014,589
PORTABLE WINDSHIELD FOR A RIDING TYPE GOLF CART

Elton C. Yerkey, P.O. Box 2545, Tuscaloosa, Ala. 35401

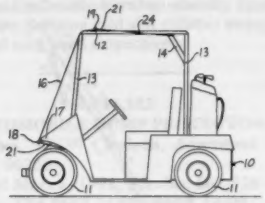
Filed Oct. 2, 1975, Ser. No. 618,743
Int. Cl.² D62J 17/00
U.S. Cl. 296—78 R 4 Claims

1. In a portable windshield for a riding type golf cart having a roof extending thereover and spaced from a lower front portion of the cart,

a. a transparent, flexible sheet of a size to extend across the forward end of the cart with the lower edge of said sheet extending under said lower front portion of the cart and the upper edge of said sheet extending over the front portion of the roof of the cart,

b. a first rigid, rod-like member attached to said sheet adjacent said lower edge thereof in position to extend transversely of the cart under said lower front portion of the cart,

c. a second rigid, rod-like member attached to said sheet adjacent said upper edge thereof in position to extend transversely of the cart and over said front portion of the roof of said cart,



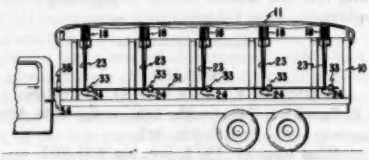
d. an elongated flexible member attached at one end to each end of said first and second rod-like member beyond the adjacent edge of said sheet with the other end of each said flexible member being attachable to said golf cart, and

e. said sheet being adapted to be rolled on one rod-like member to the other rod-like member so that said rod-like members extend alongside and adjacent each other for portability.

4,014,590
REMOVABLE TRUCK BOX COVER

Chris E. Schulz, Jr., Corwith, Iowa 50430

Filed Nov. 3, 1975, Ser. No. 627,975
Int. Cl.² B60J 11/00
U.S. Cl. 296—100 6 Claims



1. A cover for a truck box, said box having opposite longitudinal edges, the cover comprising cover means adapted to cover said box attached at one longitudinal edge to said box, spaced apart track means attached at opposite longitudinal edges to said box and adapted to support said cover means, and pulling means connected to said cover means, at least some of said track means defining a pair of parallel channels, said pulling means being adapted to run in said channels, and pulley means between said channels at one end of each of the channelled track means around which said pulling means run so as to provide for opposite directions of motion of said pulling means in adjacent channels.

4,014,591
COLLAPSIBLE CHAIR

Robert S. Gittings, Tiburon, Calif., assignor to Gold Medal, Inc., Racine, Wis.

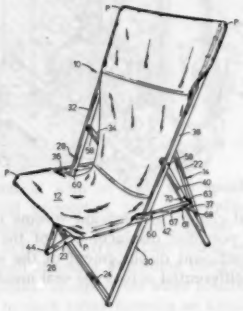
Filed Sept. 19, 1976, Ser. No. 706,509
Int. Cl.² A47C 4/00
U.S. Cl. 297—55 4 Claims

1. A collapsible chair foldable from an unfolded position into an elongated compact structure and being simultaneously collapsible in two dimensions, the collapsible chair comprising:

a front pair of crossed brace legs, each of said brace legs having an upper end and a lower end and being pivotably connected to each other intermediate their ends;

a rear pair of crossed brace legs, each of said rear brace legs having an upper end and a lower end being pivotably connected to each other intermediate their ends;

a pair of laterally spaced apart side assemblies connecting the front and rear pairs of crossed brace legs, each of said side assemblies including (1) a first brace leg having an upper end and a lower end, said upper end being pivotably connected to an upper end of one of said cross brace legs of said rear pair of crossed brace legs and said lower end pivotably connected to a lower end of one of said crossed brace legs of said front pair of crossed brace legs, (2) a second brace leg having an upper end pivotably



connected to said first brace leg intermediate the length of the latter and also having a lower end pivotably connecting to a lower end of one of said crossed brace legs of said rear pair of crossed brace legs, (3) a third brace leg having opposite ends, one of said opposite ends being pivotably connected to said upper end of one of said crossed brace legs of said front pair of crossed brace legs and (4) a pivotable stop link pivotally connected between the other of said opposite ends of said third brace leg and said second brace leg intermediate the length of the latter, and

a fabric seat supported in suspended relationship by said brace legs.

4,014,592

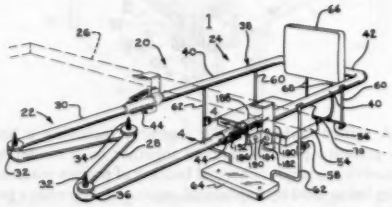
RETRACTABLE CHAIR FOR SMALL CHILDREN

Lanny J. Gist, 840 Pearl St., Bowling Green, Ohio 43402

Continuation of Ser. No. 437,070, Jan. 28, 1974. This application Jan. 22, 1975, Ser. No. 542,942

Int. Cl.² A47C *9/04*

U.S. Cl. 297—143 **8 Claims**



1. A retractable chair for small children comprising a frame having two parallel legs, means for slidably supporting said legs below a top of a table for movement of said frame between a retracted position below the table top and an extended position in which a substantial portion of said frame extends beyond an edge of the table top, a seat, two parallel links connecting said seat to one of said frame legs and two parallel links connecting said seat to the other leg of said frame to enable said seat to be pivoted from a seating position below said frame when the frame is in the extended position to a storage position near said frame when the frame is in the retracted position, a seat back, means pivotally connecting said seat back to said seat independently of said links to enable said back to be moved between a generally upright position and a lower position immediately above and adjacent to said seat, and a safety catch movable between a position engageable with the table top when said frame is extended to aid in supporting said frame and said seat from the table top, and a retracted position out of engagement with the table top when the frame is in the retracted position.

4,014,593

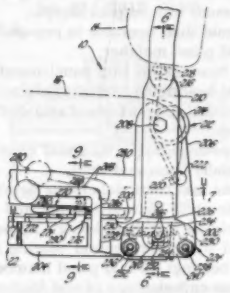
TILTING SEATBACK ADJUSTMENT MECHANISM

Robert W. Costin, Troy, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.

Division of Ser. No. 554,863, March 3, 1975, Pat. No. 3,954,245. This application Oct. 15, 1975, Ser. No. 622,574

Int. Cl.² A47C *1/025*

U.S. Cl. 297—367 **10 Claims**



1. In a vehicle seat including a seat cushion component and a generally vertically extending seat back component mounted for tilting movement in an adjusting manner with respect to the seat cushion component, a recliner mechanism for positioning the seat back component in tilted positions thereof, the recliner mechanism comprising:

a keeper fixedly mounted with respect to one of the seat components and having an edge portion with latch surfaces thereon;

a pair of support portions fixedly mounted with respect to the other seat component in spaced relationship to each other with the keeper received therebetween, each support portion including a mounting opening;

a pawl extending between and received within the mounting openings of the support portions so as to be slidably mounted on the support portions for movement between latching and nonlatching positions with respect to the latch surfaces of the keeper, the pawl being disengaged with the latch surfaces of the keeper while in the nonlatching position to permit tilting of the seat back component, the pawl being engaged with the latch surfaces of the keeper while in the latching position so as to prevent tilting of the seat back component, and forces applied to the pawl by the keeper being transferred to the support portions within the mounting openings thereof in a balanced manner due to positioning thereof on opposite sides of the keeper; and

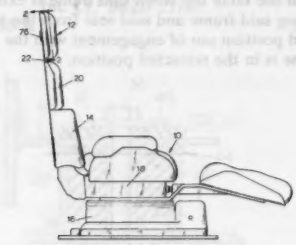
means for moving the pawl between the latching and nonlatching positions.

4,014,594

HEADREST FOR OPERATORY CHAIR

Larry A. Hain, Columbia, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Jan. 2, 1976, Ser. No. 646,303
Int. Cl.² A47C 1/10
U.S. Cl. 297—408 10 Claims



1. A headrest for an operatory chair comprising in combination:

a. an elongated support member adapted to be attached to the back member of an operatory chair,

b. a headrest panel member of predetermined area,

c. a transverse journal bearing fixed to the normally upper end of said support member,

d. a shaft mounted within said bearing for rotatable and axial movement with respect thereto,

e. means on said shaft operable to prevent rotation thereof relative said panel member,

f. additional bearings on said panel member coaxial with said journal bearing and respectively receiving and supporting opposite end portions of said shaft for axial movement therein,

g. a pair of co-engageable frictional clutch members disposed coaxially upon said shaft,

h. means fixing said frictional clutch members respectively to said transverse journal bearing and said shaft, said frictional clutch members being disposed between one end of said transverse journal bearing and one of said additional bearings on said panel members,

i. elastic means engaging one of said frictional clutch members and normally urging the same into engagement with the other clutch member,

j. combination crank and shaft means supported by said panel member and operable to engage one end of said aforementioned shaft to move the same axially in a direction to disengage said frictional clutch members and thereby permit pivotal movement of said panel member relative to said elongated support, and

k. a manually engageable member supported by said panel member substantially centrally between the side edges thereof for equal accessibility from either edge of said panel member and engageable with said combination crank and shaft means to activate the same as aforesaid.

4,014,595

DRILL BIT WITH SEAL RING COMPENSATOR

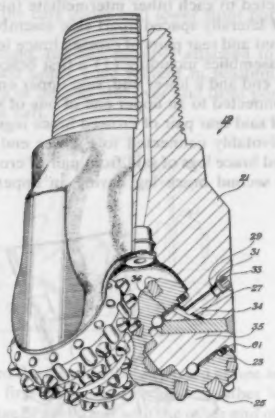
George Edward Dolezal, Laurel, Miss., assignor to Hughes Tool Company, Houston, Tex.

Filed May 30, 1975, Ser. No. 582,492
Int. Cl.² F16C 19/00
U.S. Cl. 308—8.2 8 Claims

1. In an earth boring drill bit having a rotatable cutter sealingly retained on mating surfaces of a bearing shaft, and a lubrication system, the improvement comprising:

the lubrication system having passages and spaces filled with lubricant of predetermined potential change in volume responsive to temperature and pressure changes to be encountered during drilling;

seal means between the rotatable cutter and bearing shaft capable of displacement responsive to volume change of the lubricant;



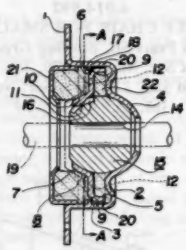
the potential change in lubricant volume being correlated with the potential displacement of the seal means to provide sufficient displacement of the seal to limit the pressure differential across the seal means.

4,014,596

SELF-CENTERABLE BEARING

Hachiro Kazama, Tokyo, Japan, assignor to Kabushikikaisha Ochiai Seisakusho, Tokyo, Japan

Filed Sept. 30, 1975, Ser. No. 618,230
Claims priority, application Japan, Jan. 29, 1975, 50-12702
Int. Cl.² F16C 9/06, 23/00
U.S. Cl. 308—72 3 Claims

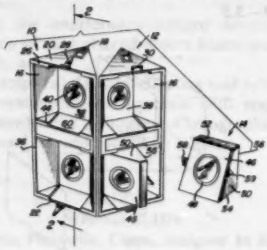


1. A self-centering bearing assembly including a housing and a pressure plate connected together by a binder means and receiving a single spherical bearing of porous material, the bearing being held by a spherical section of a receiving portion of the housing and an annular supporting portion of the pressure plate, the annular supporting portion having a peripheral wall loosely fitted to the receiving portion of the housing, a plurality of projections on the annular supporting portion engageable with a corresponding plurality of grooves on the spherical bearing, the receiving portion having an annular flange engageable with the peripheral edge of the pressure plate, and a plurality of projections on the annular flange engageable with a plurality of inclined recesses provided on the peripheral edge of the pressure plate.

4,014,597
SPEAKER ENCLOSURES

Timothy L. Griffin, Jr., Shutesbury, Mass., assignor to Amanita Sound, Incorporated, Easthampton, Mass.

Filed Aug. 27, 1975, Ser. No. 608,234
Int. Cl.² A47B 81/06, 43/00; H05K 5/00
U.S. Cl. 312—7 R 19 Claims

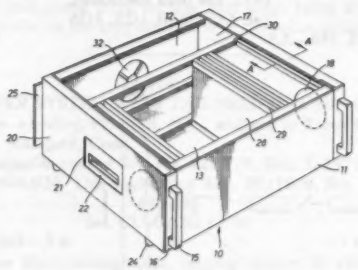


1. In combination with at least two speaker enclosures having acoustical properties and a plurality of auxiliary speaker components, means for holding said speaker enclosure assembled to form a carrying case and to internally define at least one closed chamber extending therebetween, two of said auxiliary speaker components when abutting in predetermined relation to each other forming an external configuration dimensioned to fit within said closed chamber, and means mounted within said enclosures for preventing the auxiliary speaker components stored in said predetermined abutting relationship within the closed chamber from being displaced relative to each other.

4,014,598
COMPONENT CABINET

Anthony Donald Stalley, Fleet, and Alan Martin Bishop, Newbury, both of England, assignors to Quantel Limited, England

Filed May 5, 1975, Ser. No. 574,841
Claims priority, application United Kingdom, May 6, 1974, 19846/74
Int. Cl.² A47B 77/08, 81/00
U.S. Cl. 312—236 2 Claims



1. A free standing component cabinet capable of being rapidly reconverted to allow rack mounting thereof, said cabinet comprising:

a. a frame capable of being mounted in a rack and including front, rear and side walls and front mounting flanges affixed to said frame and extending laterally beyond said side walls and having holes therein for securing said frame to a rack when mounted therein, at least one of said side walls having a vent hole therein;

b. detachable top and bottom panels enclosing said frame;

c. detachable hollow face plates mounted one on each side of the frame and providing outside walls spaced from said side walls and abutting and lying flush with the lateral edges of said front mounting flanges to form with the side wall an air duct to allow air to pass from the frame interior through said vent hole, the rear of said hollow face plates being open to permit air to discharge to the rear of said cabinet;

d. a fan mounted on said rear panel to assist the passage of air through said cabinet;

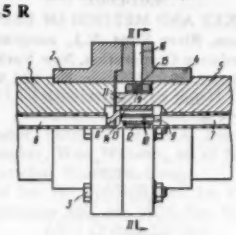
e. a detachable front handle on each of said front mounting flanges, said handle being attached thereto be fixing means passing through the holes normally used for rack mounting; and

f. rear guards extending from the rear of said side walls to provide protection for components projecting from said rear wall and to outwardly deflect exhaust air from said face plates to prevent recirculation of said air via the cooling fan.

4,014,599
DEVICE FOR ELECTRICAL COUPLING OF GENERATOR AND EXCITER ROTOR CURRENT LEADS

Nikolai Ivanovich Bogdanov, ulitsa 2 Komsomolskaya, 12, kv. 24; Vladimir Stepanovich Vitchenko, Vitebsky prospekt, 29, korpus 2, kv. 142; Gennady Konstantinovich Smirnov, ulitsa Prazhskaya, 20, kv. 132, and Vladimir Grigorievich Shalaev, prospekt Novoizmailovsky, 55, kv. 92, all of, Leningrad, U.S.S.R.

Filed July 11, 1975, Ser. No. 595,216
Int. Cl.² H01R 39/00
U.S. Cl. 339—5 R 2 Claims



1. A device for electrical coupling of generator and exciter rotor current leads comprising flexible busbars located in the area of mechanical coupling between said rotor current leads, a shaft with end face having a projection under which said flexible busbars form an overlapping joint, said busbars being placed parallel to the axis of said shaft, a clamp embracing said busbars, said busbars being attached to said shaft by means of said clamp embracing said busbars, said clamp embracing said busbars and projection in a cross-sectional plane of the shaft.

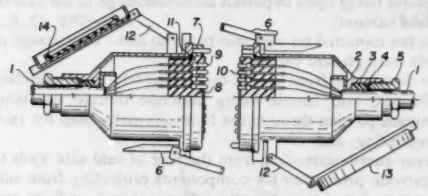
4,014,600
SELF-CLEANING DEVICE FOR DETACHABLY CONNECTING ELECTRICAL CONDUCTOR WIRES

Karl-Robert Gisewsky, Ascheberger Str. 75, Plon, Germany

Continuation of Ser. No. 491,376, July 24, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,838
Int. Cl.² H01R 31/02
U.S. Cl. 339—48 3 Claims

1. In an electrical connector for detachably connecting electrical conductor wires consisting of two coupling halves with a plurality of contact elements in a coupling half making contact with a corresponding plurality of contact elements in the other coupling half when said coupling halves are mated, the combination therewith of mounting said contact elements into an elastically resilient insulator to permit lateral movement of said contact elements, the contact elements in one coupling half having a spherical contact surface and the contact elements in the other coupling half having a trough-shaped contact surface for mating contact with said contact elements having a spherical contact surface, said trough-

shaped contact surface being unitarily inclined at an angle deviating from a perpendicular to the direction of contact pressure applied with introduction of said mating contact element to permit upon insertion of a mating contact element



having a spherical contact surface into said unitarily inclined trough-shaped contact surface lateral relative motion of said two mating contact elements with rubbing action of the contact surfaces cleaning the contact surfaces and with pushing away dirt particles contained in the trough.

4,014,601

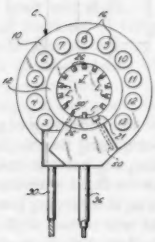
TUBE SOCKET AND METHOD OF USING SAME

Robert B. Pittman, River Edge, N.J., assignor to Industrial Electronic Hardware Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,927

Int. Cl.² H01R *5/04*

U.S. Cl. 339—275 B **23 Claims**



1. A socket for mounting a tube having a plurality of conductive contact elements disposed about the neck thereof comprising:

A. a housing defining a front surface, a back surface and an aperture extending therethrough for receipt of a tube neck;

B. spaced conductive contacts mounted on said housing having first end portions spaced from said housing front surface and adjacent said aperture for engagement with conductive contact elements disposed about the tube neck, and second end portions projecting from said housing; and

C. a member of uniform given composition having a first portion disposed within said housing and a second portion extending across and substantially completely obstructing said aperture intermediate said first contact end portions and the plane of said housing front surface; said first and second member portions being readily separably connected to one another;

whereby said second member portion blocks the passage of solder from the front of said aperture to said first contact end portions, but is easily removable from said housing to enable passage of a tube neck through said aperture.

4,014,602

IDENTIFICATION CARD HAVING A HOLOGRAM SUPERIMPOSED ON PRINTED DATA

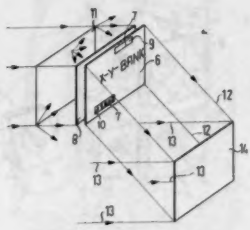
Hartwig Ruell, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 5, 1976, Ser. No. 646,842

Claims priority, application Germany, Jan. 16, 1975, 2501604

Int. Cl.² G03H *1/04*; B44F *1/12*

U.S. Cl. 350—3.5 **26 Claims**



1. A falsification-proof identity card comprising:

a transparent first layer being visible printed data on a first surface thereof;

a second layer connected to said first layer and covering said first surface; and

a hologram carried by said second layer on a first surface thereof which faces said first surface of said first layer, said hologram covering said entire first surface of said second layer and containing identification data, including at least the visible data of said first layer, and said hologram responsive to light to visibly reconstruct said identification data.

4,014,603

METHOD OF HOLOGRAPHIC RECORDING

Roland Moraw; Günther Schädlich, both of Naurod, and Klaus Horn, Hochst, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

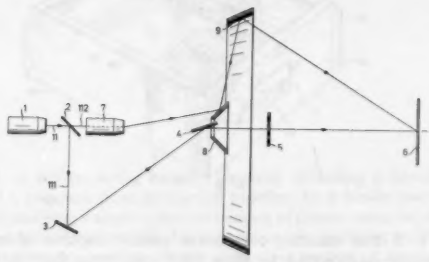
Division of Ser. No. 519,585, Oct. 31, 1974, Pat. No. 3,970,357. This application Jan. 2, 1976, Ser. No. 646,174

Claims priority, application Germany, Nov. 5, 1973, 2355136

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.² G03H *1/28, 1/26*

U.S. Cl. 350—3.5 **6 Claims**



1. A method of recording a plurality of holographic images upon the same region of a recording medium comprising the steps of:

a. directing a radiation beam from a coherent radiation source along an optical axis of said apparatus,

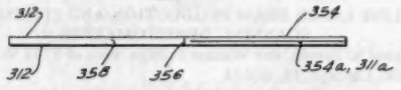
b. splitting said radiation beam to provide a single reference beam on said optical axis and an object beam off of said optical axis,

c. deflecting said reference beam in a direction divergent with respect to said optical axis,
d. after deflecting said reference beam, reflecting said reference beam in a convergent direction with respect to said optical axis,
e. reflecting said object beam from said off optical axis direction to a direction substantially along said optical axis,
f. positioning an object on said optical axis for altering said object beam,
g. recording the interference pattern developed by the interference of said altered object beam and said reference beam, and
h. repeating steps (a)–(g) by deflecting said reference beam in a different divergent direction with respect to said optical axis whereby a plurality of holographic images are superimposed on said recording medium.

4,014,604
SOUND SLIDE

Morris Schwartz, Plainville, Conn., assignor to Kalart Victor Corporation, Plainville, Conn.

Continuation-in-part of Ser. No. 402,168, Oct. 1, 1973, Pat. No. 3,897,145. This application May 14, 1975, Ser. No. 577,224
Int. Cl.² G03B *21/00*, *31/06*; G11B *21/02*
U.S. Cl. 353—120 **1 Claim**



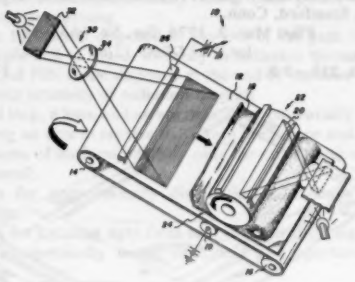
1. A sound slide assembly comprising: a substantially rectangular plate-shaped frame body made of rigid material, said body incorporating an image-bearing section and a magnetic sound track section, said image-bearing section including four side portions defining one opening adapted to receive and maintain in fixed position a photographic transparecny, one of said side portions having a crosswise width larger than the other side portions, said one side portion constituting a support base for said sound track section, said support base being covered on its opposite surfaces with magnetic recording material for receiving on said material on each of said surfaces a sound track, and a hinge section joining the image-bearing section and the sound track section for varying the angle between the plane of said image-bearing section relative to the plane of said sound track section, said hinge being disposed perpendicular to the long dimension of the rectangular body.

4,014,605
TRANSFER SYSTEM WITH TAILORED ILLUMINATION

Gerald M. Fletcher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 421,179, Dec. 3, 1973, Pat. No. 3,846,020. This application Aug. 20, 1974, Ser. No. 498,900
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **17 Claims**

1. In an electrostatographic copying system in which an image is formed on an imaging surface and electrostatically transferred at a transfer station to a copy surface, the improvement comprising:
a copy transport belt having a copy supporting surface and an opposite surface,
said belt comprising a photoconductive layer;
means for moving said copy supporting surface of said belt into and out of engagement with said imaging surface at said transfer station to from pre-nip, nip, and post-nip areas therewith, respectively;
electrically biased transfer electrode means for applying an image transfer field to said imaging surface through said photoconductive layer of said belt at said transfer station in said pre-nip, nip and post-nip areas; and
illumination means for illuminating only said nip and post-

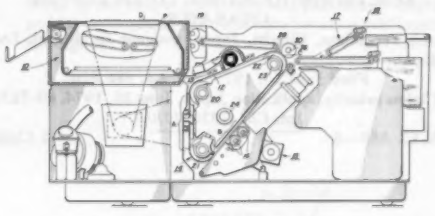


nip areas of said photoconductive layer and rendering them conductive for tailoring said image transfer field for a relatively lower pre-nip transfer field than post-nip transfer field.

4,014,606
REPRODUCTION MACHINE WITH TEXTURED TRANSFER ROLLER

Donald A. Seanor, Pittsford; James A. Lentz, Penfield, and Thomas Meagher, West Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 410,063, Oct. 24, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,514
Int. Cl.² G03G *15/16*
U.S. Cl. 355—3 R **1 Claim**



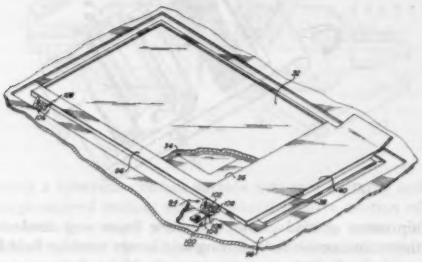
1. A reproduction machine comprising:
means defining a surface, the surface being mounted for movement around a closed path;
means for forming a developed electrostatic image on the surface;
a transfer roller in contact with the surface and mounted for rotation about an axis;
means for feeding a sheet of support material between the surface and the transfer roller so that transfer of the developed electrostatic image from the surface to the sheet can be effected as the sheet is moving therebetween; and
means formed on the peripheral surface of the transfer roller for preventing the sheet from electrostatically tacking itself to the transfer roller during transfer while simultaneously causing the sheet to electrostatically tack itself to the surface.

4,014,607

REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE

Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,388
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 11 Claims



1. An electrophotographic printing machine for reproducing a transparency or opaque original document, including:

a transparent platen;

a photoconductive member;

means for charging said photoconductive member to a substantially uniform level;

means for forming a light image of the transparency; and

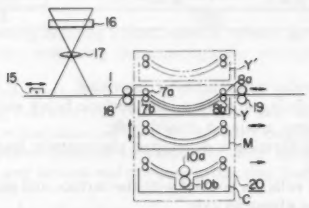
means, mounted movably on said transparent platen, for modulating the light image, said modulating means being movable from a first position remote from the transparency light image path for reproducing the opaque original document to a second position in the transparency light image path for reproducing the transparency, said forming means projecting the transparency light image through said modulating means onto the charged portion of said photoconductive member to selectively dissipate the charge recording thereon a modulated electrostatic latent image of the transparency.

4,014,608

DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHIC COLOR COPYING APPARATUS

Isamu Terashima, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed June 13, 1975, Ser. No. 586,820
Claims priority, application Japan, June 26, 1974, 49-72307
Int. Cl.² G03G 15/01
U.S. Cl. 355—4 2 Claims



1. A developing apparatus for a color picture comprising a plurality of developing means each moving relative to a recording medium with electrostatic latent images thereon, each developing means being provided at the intake and the exit with rollers, means for reciprocately moving said recording medium, according to the order of the successively arranged colors to be developed, relative to said respective developing means and also for moving said recording medium in a unidirectional mode relative to said developing means corresponding to the last color to be developed; said developing means corresponding to the last color to be developed being provided therein with means for temporarily removing the degraded developer on the surface of said recording medium.

4,014,609

PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

Gerald C. VerSchage, Henrietta, N.Y.; Bernard C. Fisk, Dallas, Tex., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,664, Aug. 12, 1974, Pat. No. 3,944,359. This application Nov. 3, 1975, Ser. No. 628,672
Int. Cl.² G03G 15/00
U.S. Cl. 355—14 5 Claims

1. In a reproduction system including an electrostatic type reproduction machine for producing copies from originals, the combination of:

control means for programming the reproduction system to produce one or more copy reproduction runs;

program storage means for storing the reproduction run program generated by said control means pending use by said reproduction system; and

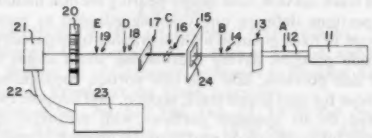
program ordering means for placing the reproduction run program generated by said control means in predetermined order in said program storage means irrespective of the order in which said reproduction runs are programmed into said control means.

4,014,610

LINE LASER BEAM PRODUCTION AND ITS USE IN SCANNING DENSITOMETERS

Rashid A. Zeineh, and William P. Nijm, both of 5742 W. Dakin St., Chicago, Ill. 60634

Filed Feb. 3, 1975, Ser. No. 546,514
Int. Cl.² G01N 21/22
U.S. Cl. 356—201 4 Claims



1. A light source for a soft laser scanning densitometer/spectrophotometer comprising a laser light source emitting a spot laser beam, a sharp edge movable to intercept part or all of the spot laser beam, the direction of said laser beam being perpendicular to the plane of said sharp edge and the movement of the sharp edge being in a plane perpendicular to the laser beam, a restrictor having an opening positioned in the path of the laser beam after said sharp edge, said restrictor opening passing a segment of that part of the laser beam produced by diffraction effects at said straight edge through a single cylindrical focusing means having its axis perpendicular to the sharp edge and in the path of said beam, said focusing means being positioned so that it focuses said laser beam to a thin line laser beam at an object to be scanned.

4,014,611

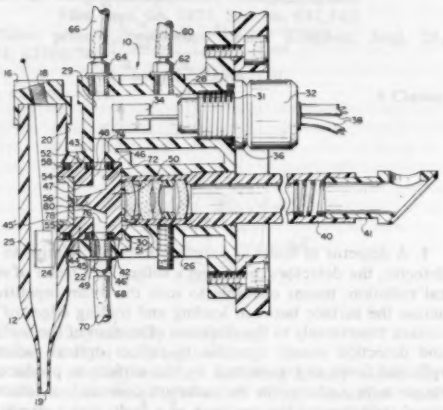
APERTURE MODULE FOR USE IN PARTICLE TESTING APPARATUS

Ronald O. Simpson, Miami, and Thomas J. Godin, West Hollywood, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 30, 1975, Ser. No. 573,265
Int. Cl.² G01N 21/00, 27/00
U.S. Cl. 356—72 16 Claims

1. An aperture module for use in particle testing apparatus including a container of particulate liquid suspension to be tested, said module comprising, a housing having a first chamber and a second chamber, an aperture holder formed of optically clear material disposed in the second chamber and

having an aperture provided therein, the aperture holder having a closed end and the closed end forming a wall in the second chamber, the aperture holder extending into the container with the aperture in communication on one side thereof with the liquid suspension, a passageway in the module connecting the chambers and passing through the aperture holder, the aperture being in communication on the side opposite said one side with the passageway, a first electrode in the container and a second electrode in the first chamber to establish an electrical field in the aperture between the container and the aperture module, there being a zone in the passageway proximate to the aperture in which spurious signals may normally be produced, means for connecting the passageway at an entrance thereof to a source of particle free liquid and means for connecting the pssageway at an exit thereof to fluid moving means to move the particle free liquid through the passageway and simultaneously move the suspension from the container through the aperture into the spurious



signal producing zone, means including electrical leads connected to said electrodes and adapted to extend connections to a detector to respond to electrical measuring signals produced across said electrodes with passage of particles through said aperture, the aperture holder having a projection formed on the closed end of the aperture holder and extending into the passageway to form a restriction therein proximate the aperture to cause the flow velocity of the particle free liquid to increase in the spurious signal producing zone and continuously wash the zone simultaneously with passage of the suspension through the aperture such that particles which have passed through the aperture immediately are swept out of the spurious signal producing zone by the particle free liquid and moved to the exit of the passageway, and an objective lens assembly positioned in the second chamber adjacent said well formed by the closed end of the aperture holder on the side thereof opposite that having said projection for visually examining the aperture during movement of the suspension therethrough.

4,014,612

PHOTOMETRIC MEASURING APPARATUS

John G. Atwood, Redding; Hamilton W. Marshall, Jr., Ridgefield; Charles F. Demey, II, West Redding, and Wilson P. Ralston, Stamford, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 22, 1974, Ser. No. 499,855

Int. Cl.² G01J *3/42*

U.S. Cl. 356—88 **6 Claims**

1. In photometric apparatus for the type wherein absorbance through a sample cell in one of two radiation paths is determined by directing light from a source of predetermined wavelength contemporaneously along both paths, the improvement comprising:

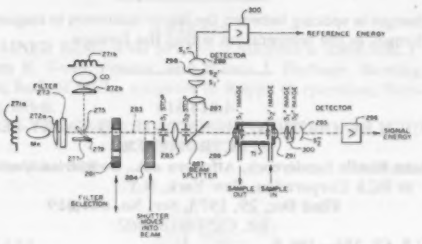
a first PIN diode disposed at the end of the path with the sample cell to detect intensity of radiation thereat;

a second PIN diode disposed at the end of the oher path to detect intensity of radiation thereat;

a field stop, a lens, and an aperture stop sequentially aligned along an axis to receive light from the source and to pass a beam of uniform intensity over the cross-sectional area thereof;

means for proportionally distributing said beam to the paths;

means for focusing light from said beam distributing means to symmetrically image said field and aperture stops



substantially at the entrance and exit respectively of the sample cell;

means for focusing light that passes from the sample cell to symmetrically image said aperture stop wholly on the sensitive area of said first PIN diode;

means for focusing light from said beam distributing means to symmetrically image one of said field and aperture stops wholly on the sensitive area of said second PIN diode;

first and second parametric amplifiers separately disposed to receive the outputs from said first and second PIN diodes respectively; and

circuit means for deriving signals logarithmically proportional to the output from each said parametric amplifier and for determining the difference between said logarithmic signals.

4,014,613

METHOD AND APPARATUS FOR DETERMINING CHANGES IN SPACING BETWEEN TWO POSITIONS OF INTEREST

William N. Sharpe, Jr., Ingham County, Mich., and Glenn W. Hollenberg, Benton County, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

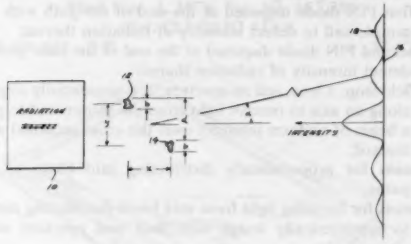
Filed Sept. 10, 1975, Ser. No. 612,070

Int. Cl.² G01B *9/02*

U.S. Cl. 356—106 R **3 Claims**

3. The method of determining the changes of relative lengths between a test bar of material and a standard bar specimen, having a length slightly different than the length of the test bar specimen, on a support within a furnace; securing a first linear polycrystalline alumina fiber scatterer to the end, of the test bar specimen, remote from said support; securing a second linear polycrystalline alumina fiber scatterer to the end, of the standard bar specimen, remote from said support; directing a beam of coherent monochromatic light past the

two linear scatterers; measuring the movement of interference fringes, past a predetermined point, resulting from the



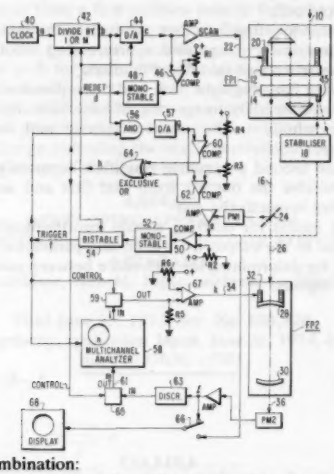
changes in spacing between the linear scatterers in response to changes in the temperature within the furnace.

4,014,614

HIGH RESOLUTION, HIGH CONTRAST FABRY-PEROT SPECTROMETER

John Riddle Sandercock, Affoltern a.A., Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,819
Int. Cl.² G01B 9/02
U.S. Cl. 356—106 S **12 Claims**



1. In combination:

a plane mirror Fabry-Perot interferometer of the type including a pair of spaced plane mirrors which can be translated with respect to each other,

first mirror translating means for cyclically shifting the separation of said plane mirrors at a first rate and means for shifting the separation of said plane mirrors during a portion of each cycle at a second rate slower than said first rate, said plane mirror interferometer providing an output signal having a synchronizing portion and a data portion in each cycle, said data portion occurring during said slower cycle portion,

a spherical mirror Fabry-Perot interferometer disposed to receive said output signal as an input thereto, said spherical mirror interferometer including a pair of spaced spherical mirrors, and

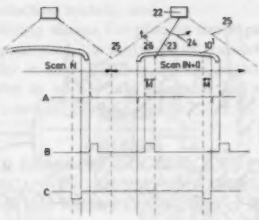
second mirror translating means responsive to said output signal synchronizing portion applied as an input thereto for changing the spacing of the spherical mirrors to a given spacing during each said cycle, and for shifting the spacing of said spherical mirrors to a different mirror spacing for each successive cycle whereby said spherical mirror interferometer scans at least said data portion in a plurality of successive cycles.

4,014,615

DETECTION OF FAULTS IN A PREDETERMINED AREA OF A SURFACE

Graham Morley Clarke, Edinburgh, Scotland, assignor to Ferranti, Limited, Hollinwood, England

Filed May 27, 1975, Ser. No. 580,567
Claims priority, application United Kingdom, May 28, 1974, 23570/74
Int. Cl.² G01N 21/16, 21/32
U.S. Cl. 356—200 **12 Claims**



1. A detector of faults in a surface movable relative to the detector, the detector comprising a source of a beam of optical radiation, means operable to scan the beam repetitively across the surface between leading and trailing edges of the surface transversely to the direction of motion of the surface, and detection means operable to collect optical radiation reflected from, or transmitted by, the surface to produce, in response to a change in the radiation collected, a detection signal indicative of the presence of a fault, and a circuit arrangement including edge detection means for producing edge signals in response to the detection of the leading- and trailing-edges of the surface, control means operable to produce a first signal in response to the detection of the leading-edge, and a second signal in response to the detection of the trailing-edge, said second signal defining in relation to the traverse speed of the beam a trailing-edge margin the width of which is greater than any anticipated variation in the position of the trailing-edge of the surface between successive scans, and output means responsive to a detection signal occurring in the time interval between a first signal and the subsequent second signal to indicate the presence of a fault.

4,014,616

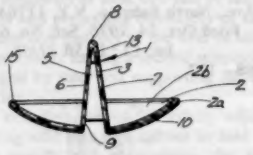
DISPOSABLE PRODUCT APPLICATOR AND DISPENSING PACKAGE THEREFOR

John George Mast, Jr., and Paul James Green, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 18, 1976, Ser. No. 668,254
Int. Cl.² B65H 1/08; A47F 1/04
U.S. Cl. 401—292 **28 Claims**

1. A hand-held, generally T-shaped disposable product applicator comprising a body portion and a handle portion, said body portion having product-applying bottom surface and a top surface, said handle being located on said top surface and extending transversely thereof and upwardly therefrom, said handle portion having upwardly and inwardly sloping side walls and upwardly and inwardly sloping side edges, said side walls providing finger-grip surfaces, said handle portion being

hollow, said bottom surface of said body portion having an opening therein leading to the interior of said hollow handle



portion, said applicator being stackable with a similar applicator with their handle elements in telescoped relationship.

4,014,617

COUPLING ASSEMBLIES

Spencer Davidson Meston, Bristol, England, assignor to British Aircraft Corporation Limited, London, England

Filed Sept. 26, 1975, Ser. No. 617,163

Claims priority, application United Kingdom, Sept. 28, 1974, 42260/74

Int. Cl.² F16D *3/50*

U.S. Cl. 403—111 **4 Claims**

1. A coupling assembly, comprising:

an outer annular coupling member;

an inner coupling member extending axially within the outer annular coupling member with a substantial radial clearance therebetween, perimetrically thereof; and

a plurality of at least three flexible, substantially inextensible ligaments each connected at two respective connection sites axially spaced along the length thereof to the outer annular coupling member at angularly spaced locations on the outer coupling member and to the inner coupling member;

the distance along each ligament between said two sites thereof being substantially greater than the length of said radial clearance but insufficiently great as to permit the inner coupling member to contact the outer annular coupling member, whereby the outer annular and inner coupling members are loosely interconnected for substantial relative rotational movement and substantial relative oscillatory movement, limited by tautening of at least one of the ligaments.

4,014,618

CORNER STRUCTURE

Kai Hestbech Kristiansen, Vilh Kyhnsalle 3, Hojbjerg, Denmark

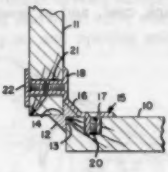
Filed July 3, 1975, Ser. No. 593,147

Claims priority, application Denmark, July 8, 1974, 3646/74

Int. Cl.² F16B *12/00*

U.S. Cl. 403—205 **4 Claims**

1. A corner structure for use in shelves, cabinets, boxes and similar boxshaped objects, which are made from rectangular panels, said corner structure comprising a recessed rod-shaped junction of substantially hourglass-shaped cross-section into the recesses of which the borders of the panels are received, said junction having projections extending from each of the recesses to bear against the inner surfaces of the panels to be assembled at a corner, said projections being



designed so that they can be attached to the panels by suitable fastening means.

4,014,619

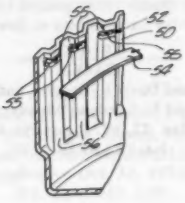
RETAINER RING AND SPLINED MEMBER ASSEMBLY

William K. Good, Pontiac, and Wilson J. Harbage, Birmingham, both of Mich., assignors to Koppy Corporation, Ferndale, Mich.

Filed Sept. 29, 1975, Ser. No. 617,814

Int. Cl.² F16B *21/18*

U.S. Cl. 403—359 **3 Claims**



1. In combination: a splined member and a snap type retaining ring, said splined member having a plurality of splines each having a root section and being disposed about the periphery of said splined member; a slot disposed in said splined member for receiving said snap ring, said slot being defined by a series of individual lances disposed in the root section of each spline, said lances being disposed in parallel pairs and the material between said individual pairs of lances being disposed in a plane spaced away from said root sections a distance equal to the depth of said root sections whereby said pairs of lances and said displaced material form said slot for receiving said snap type bearing ring.

4,014,620

VIBRATORY TAMPER

Gülertan Vural, Emmelshausen, and Udo Carle, Hohr-Grenzhausen, both of Germany, assignors to Koehring GmbH - Bomag Division, Boppard (Rhine), Germany

Filed Aug. 28, 1975, Ser. No. 608,772

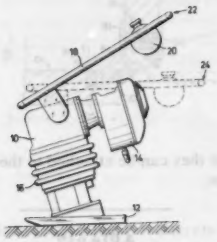
Claims priority, application Germany, Aug. 28, 1974, 2441180

Int. Cl.² E01C *19/34*

U.S. Cl. 404—133 **13 Claims**

1. In a vibratory tamper comprising a crank case, a motor unit laterally mounted on said crank case, a gear unit, a crankshaft driven by said motor unit through said gear unit, a movable intermediate member, a crank arm connecting said intermediate member to said crankshaft for reciprocation of said intermediate member, guide means for guiding said intermediate member linearly when said intermediate member is reciprocated, a movable tamping foot, and at least two oppositely acting springs mounted between said intermediate member and said tamping foot whereby motion is transmitted to said tamping foot from said intermediate member, the improve-

ment wherein said gear unit is a planetary gear comprising an inner wheel, a hollow intermediate shaft connected to said crankshaft and having a hollow portion, means journalling said inner wheel in said hollow portion, an outer wheel rigidly attached to said crank case, and at least one intermediate



planet wheel coupled to said intermediate shaft and engaging between said inner and outer wheels, said tamper including means drivingly connecting said motor unit to said inner wheel, and wherein said oppositely acting springs overlap at least partially in the axial direction.

4,014,621

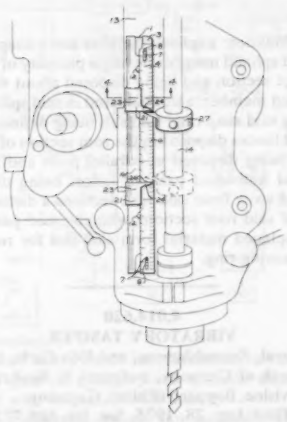
GAUGE

Ray W. Johnson, and David L. Gordon, both of Wichita, Kans., assignors to David L. Gordon, Wichita, Kans.

Filed Jan. 22, 1976, Ser. No. 651,415

Int. Cl.² B23B *49/00*

U.S. Cl. 408—16 **7 Claims**



1. A gauge comprising

a scale element having a scale longitudinally marked thereon,

a gauge body having a longitudinal bottom adapted to be placed on a surface and a longitudinal top spaced from said bottom accommodating said scale element thereon,

a longitudinal guide rail extending laterally along said body,

a pair of spaced pointer members, each member comprising a pointer body slidably supported along said guide rail and being selectively positioned thereon,

a pointer finger projecting from each pointer body over said scale for indicating a predetermined distance between adjusted positions of said pointer members,

and means to detachably secure said scale on said longitudinal top of said gauge body.

4,014,622

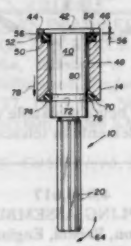
REAMER

Robert E. Lotz, c/o Aboton Machine & Tool Co., Inc., 727 Mount Ave., North Babylon, N.Y. 11704

Filed Oct. 24, 1975, Ser. No. 625,766

Int. Cl.² B23B *31/08*

U.S. Cl. 408—127 **3 Claims**



1. An improved reamer having a select extent of pivotal movement during reaming service, said improved reamer comprising a cylindrical bushing having a central through bore therein terminating in opposite front and rear openings, an elongated reamer body adapted to be projected through said rear opening of said through bore of said cylindrical bushing in the direction of said front opening thereof to provide an operative mounting of said reamer within said cylindrical bushing, a key of a generally rectangular shape extending generally perpendicularly of said reamer body so as to present opposite key arms extending laterally of one end of said reamer body limiting said projecting movement of said reamer body relative to said cylindrical bushing, said cylindrical bushing having a wall bounding a counterbore at the end thereof adjacent said key forming a seat at said bushing end, said cylindrical bushing wall having two cut-outs spaced 180° apart forming key ways therein cooperating with said key for holding said reamer body against rotation during reaming service thereof, each said cut-out adapted to receive a cooperating one of said key arms, and an elastomeric ring mounted in encircling relation about said reamer body adjacent said key having an operative position located in said seat, whereby said non-rotative reamer body nevertheless has a canting degree of movement during said reaming service which is permitted by compression of said elastomeric ring.

4,014,623

BORING ROD EXTENSION WITH TWO COUNTER-ROTATING BORING TOOL CARRIERS

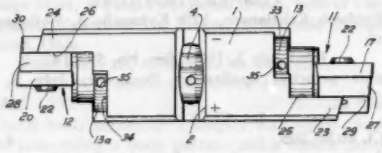
Otto Eckle, Lochgau, Germany, assignor to KOMET Stahlhalter-und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

Filed Nov. 26, 1974, Ser. No. 527,225

Claims priority, application Germany, Dec. 1, 1973, 2360000

Int. Cl.² B23B *29/034, 51/00*

U.S. Cl. 408—183 **10 Claims**



1. A boring rod extension, comprising:

elongated housing means having an opening extending therethrough;

a first tool carrier mounted in said opening and having a portion thereof extending axially outwardly of said open-

ing, said portion having a first cutting tool mounted thereon and a first supporting surface spaced from said first cutting tool;

first projection means on at least one end of said elongated housing means and projecting outwardly of said housing means in a direction parallel to the axis of said opening, said projection means having a second supporting surface thereon engaged by said first supporting surface on said first tool carrier;

first adjustable coupling means for axially adjustably and fixedly coupling said first tool carrier in said opening of said housing means and maintaining the engagement between said first and second supporting surfaces for effecting a transfer of forces acting on said first tool carrier directly to said projection means to thereby strengthen the connection of said first tool carrier to said housing means;

a second tool carrier mounted in said opening and having a portion thereof extending axially outwardly of said opening but in a direction opposite to said first tool carrier, said portion of said second tool carrier having a second cutting tool mounted thereon and a third supporting surface spaced from said second cutting tool;

second projection means on an end of said housing means snd projecting outwardly of said housing means in a direction parallel to the axis of said opening and opposite to said first projection means, said second projection means having a fourth supporting surface thereon engaged by said third supporting surface on said second tool carrier;

second adjustable coupling means for axially adjustably and fixedly coupling said second tool carrier in said opening of said housing means and maintaining the engagement between said third and fourth support surfaces for effecting a transfer of forces acting on said second tool carrier directly to said second projection means to thereby strengthen the connection of said second tool carrier to said housing means, said first and second adjustable coupling means including an adjusting bushing mounted in said opening and has a pair of axially spaced first connecting means thereon and said first tool carrier and said second tool carrier each have second connecting means thereon for connectingly cooperating with said first connecting means, a chuck socket encircling each of said first and second tool carriers, each of said chuck sockets having an external conical surface separated by a region extending over more than 180° in relation to a cutting edge on each of said cutting tools; and

securing means for securing each of said chuck sockets against rotation relative to said housing means.

4,014,624

METHOD AND DEVICE FOR STARTING PUMP

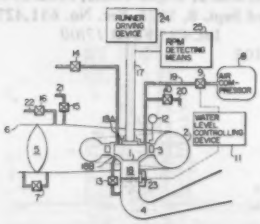
Mituo Takase, Mito; Hisao Inoue, Hitachi; Takeo Hachiya, Hitachi, and Katsumi Seno, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 15, 1975, Ser. No. 604,946
Claims priority, application Japan, Aug. 16, 1974, 49-93341
Int. Cl.² F01D *17/00*
U.S. Cl. 415—1 **13 Claims**

1. In a method for starting a pumping operation of a pump device which includes a runner; a runner driving device; a runner chamber housing therein said runner; a plurality of openable guide vanes provided along the outer periphery of said runner chamber; a casing surrounding said guide vanes; a discharge tube coupled to said casing; a main valve; a by-pass valve, said main valve and said by-pass valve being provided in said discharge tube; a drain valve discharging from said runner chamber leaking water introduced therein; a compressed air feeding device connected to said runner chamber; an exhaust valve for discharging compressed air from the runner chamber; and a leaking water supply valve connected to said casing; the improvements comprising the steps of:

closing the main valve, by-pass valve and guide vanes, opening the drain valve, and feeding compressed air to said runner chamber until said runner chamber is filled with compressed air and said runner is exposed to compressed air;

energizing said runner driving device, thereby rotating the runner, closing said drain valve when said runner reaches a specified r.p.m. and opening said exhaust valve after



said drain valve has been completely closed, thereby discharging compressed air from said runner chamber; and

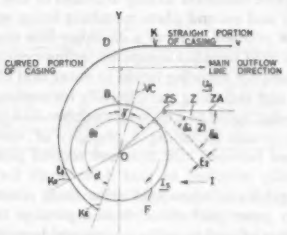
bringing said main valve, by-pass valve and guide vanes to an open position according to rise of water pressure in the vicinity of said runner periphery in said runner chamber, and closing said leaking water supply valve connected to the casing as well as said exhaust valve.

4,014,625

TRANSVERSE FLOW FAN

Teruo Yamamoto, 974 Hohjoh, Himeji, Hyogo, Japan

Continuation-in-part of Ser. No. 389,512, Aug. 20, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,787
Int. Cl.² F04D *5/00*
U.S. Cl. 415—54 **7 Claims**



1. A transverse flow fan having a casing with an inlet and an outlet, an annular impeller rotatably mounted in said casing between said inlet and said outlet and having outwardly curved blades therein with an inner blade angle β_1 at the inner periphery of the impeller and an outer blade β_2 at the outer periphery of the impeller, at least one hand-shaped annular member on said impeller around the outer periphery thereon for partial control of the flow, the casing having end walls generally parallel with the end faces of the annular impeller, a curved outer wall between said end walls and curving around said impeller and to said outlet, and a tongue forming an inner wall having an inflow space side extending from said inlet to a point adjacent said impeller and an outflow space side at an angle of less than 180° to said inflow space side and extending from said impeller to said outlet, the inflow space side of said tongue and said end walls defining an inflow space, said outflow space side of said tongue, said end walls and said outer wall defining an outflow space, the angle δ_1 on the inlet space side of said tongue between the surface of the said torque and a line intersecting the tip of the tongue and parallel to a tangent to the impeller adjacent said tip of said tongue being in

the range (β_2−15°) δ_1 (β_2+15°) and the distance ϵ_2 between the impeller and the tip of the tongue in the radial direction of the impeller being 0.03 F_D to 0.15 F_D, wherein F_D is the outside diameter of the impeller.

4,014,626

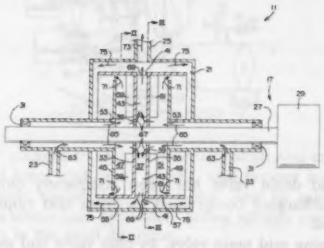
CENTRIFUGAL PUMP MEANS

James F. Grenn, Rte. 2, Bogue Chitto, Miss. 39629

Filed Sept. 8, 1975, Ser. No. 611,427

Int. Cl.² F04D *17/00*

U.S. Cl. 415—102 **1 Claim**



1. Centrifugal pump means for pumping liquid, said pump means comprising:

a. housing means including a hollow interior, including centrally located inlet means for allowing liquid to enter said interior, and including peripherally located outlet means for allowing liquid to exit said housing means;

b. drive means including a drive shaft extending into said interior of said housing means centrally thereof and including a motor means for selectively rotating said drive shaft;

c. impeller means positioned within said interior of said housing means, said impeller means including first and second plate members fixedly attached to said drive shaft, said first and second plate members being spaced apart from one another to form a chamber-like portion therebetween, said impeller means including centrally located inlet means for allowing liquid to enter said chamber-like portion and including peripherally located outlet means for allowing liquid to exit said chamber-like portion, said impeller means including a plurality of vane members positioned between said first and second plate members and fixedly attached to said drive shaft for creating a centrifugal force when said drive shaft rotates to cause liquid to enter said chamber-like portion through said inlet means of said impeller means and to exit said chamber-like portion through said outlet means of said impeller means; and

d. seal means for preventing the liquid exiting said chamber-like portion of said impeller means through said outlet means of said impeller means from reentering said chamber-like portion of said impeller means through said inlet means of said impeller means, said seal means including first and second disklike members fixedly attached to said interior of said housing means substantially aligned with said first and second plate members of said impeller means, said first disklike member being spaced away from said first plate member of said impeller means to form a chamber-like portion therebetween, said second disklike member being spaced away from said second plate member of said impeller means to form a chamber-like portion therebetween, each of said first and second disklike members including a centrally located opening for allowing liquid to enter said respective chamber-like portions from said inlet means of said housing means, said seal means including a first annular flange member attached to the periphery of said first plate member of said impeller means and extending over and spaced above the periphery of said first disklike member, said seal means including a second annular flange member attached to the periphery of said second plate member of said impeller means and extending over and spaced above the periphery of said second disklike member, said seal means including a plurality of vane members positioned in each of said chamber-like portions thereof and fixedly attached to said first and second plate member of said impeller means for rotation therewith to force liquid in said first and second chamber-like portion to exit said first and second chamber-like portion through the space between said first and second disklike member and said first and second annular flange member respectively thereby preventing the liquid exiting said chamber-like portion of said impeller means from entering said first and second chamber-like portions of said seal means.

4,014,627

COMPRESSOR STATOR HAVING A HOUSING IN ONE PIECE

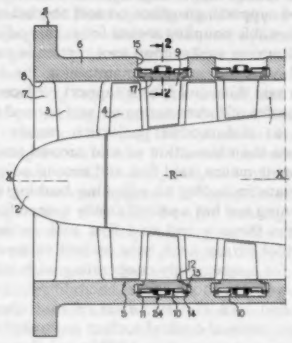
Bernard Heurteux, Verviers, Belgium, assignor to Shur-Lok International S.A., Petit-Rechain, Belgium

Filed July 22, 1975, Ser. No. 598,027

Claims priority, application France, Aug. 21, 1974, 74.28742

Int. Cl.² F01D *1/02*

U.S. Cl. 415—189 **11 Claims**

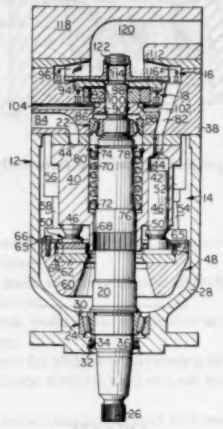


1. A compressor stator comprising in combination: a housing wall of revolution about an axis which wall is in one piece and defines an inner surface of revolution and an outer surface, means defining an annular groove in said wall extending radially outwardly from said inner surface and terminating short of said outer surface, the groove having a radially outer annular part and a radially inner annular part of smaller width axially of said wall than said outer part, said outer and inner annular parts of the groove defining therebetween radially outwardly fixing shoulder means, means defining in said wall at least one radial opening putting the groove in communication with said outer surface of said wall; at least one row of vanes, each of said vanes having a base which is mounted in the groove and has a width axially of said wall which is larger than the width of said inner part of the groove, the bases being in abutting relation to said shoulder means, the radial opening being of a size permitting the vane bases to be inserted one by one into the groove by way of the radial opening, the vane bases being in contiguous relation to each other, the groove defining with the vane bases an annular gap encompassing the row of vane bases; and annular fixing means disposed in said annular gap for clamping the vane bases radially against said shoulder means, the fixing means comprising a chain having chain links and pivotal connecting means interconnecting the links, and tightening means for tightening the chain round the vane bases, and the fixing means being capable of exerting a radial force on each one of the vane bases through the chain links.

4,014,628
SUPERCHARGED THREE-SECTION PUMP

Walter Zdzislaw Ruseff, New Lenox, and Gilbert Tribley, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 15, 1975, Ser. No. 577,808
Int. Cl.² F04B *23/10*, *23/14*; F01B *13/04*
U.S. Cl. 417—203 6 Claims



1. A three-section pump assembly comprising

a pump body

a variable displacement piston pump arranged generally toward one axial end of the body and having a stationary head unit formed by a portion of pump body,

a drive shaft for the piston pump extending in cantilevered fashion through the head unit, a supercharging centrifugal pump and an additional positive displacement rotary pump being arranged in axial alignment with the piston pump and having rotary portions mounted in driving relation upon the cantilevered end of the common drive shaft, the positive displacement rotary pump disposed between the centrifugal pump and the piston pump, each of the centrifugal and positive displacement rotary pumps including respective fluid inlets and fluid outlets, the fluid outlet for the supercharging centrifugal pump being in communication with an inlet for the variable displacement piston pump, and the fluid inlet for the positive displacement rotary pump in communication with the fluid outlet of the supercharging centrifugal pump,

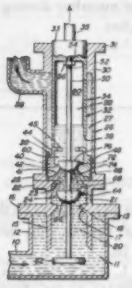
the head unit portion of the pump body formed with three stepped counterbores, the positive displacement rotary pump being arranged within a first one of the counterbores and the centrifugal pump being arranged with the third one of the stepped counterbores, a spacer means being arranged within the second stepped counterbore in order to separate the centrifugal pump from the gear pump.

4,014,629
PUMP FOR PUMPING BOTH LOW VISCOSITY AND HIGH VISCOSITY FLUIDS

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,320
Int. Cl.² F04B *7/00*
U.S. Cl. 417—259 11 Claims

1. An improved pump for pumping fluids with a viscosity ranging from 1 to 1 million centipoise at 25° C without any mechanical adjustments comprising a body having therein a first cavity, a second cavity connecting to said first cavity and a third cavity connecting to said second cavity, a hollow cylinder with a closed end and an open end positioned within said first cavity such that said open end is totally within said first cavity, a cylinder head with a fourth cavity therein connected to the open end of said hollow cylinder, a shaft having a first end and a second end connected to said closed end of said hollow cylinder at its first end and passing through said first,

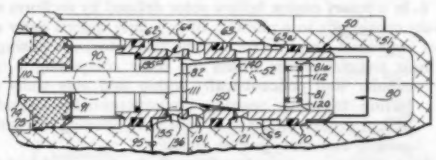


second, third and fourth cavities, a first valve means positioned about said shaft and positioned to move in said fourth cavity, a second valve means positioned about said shaft and positioned to move in said second cavity and kick plate means connected at said second end of said shaft and positioned to move within said third cavity.

4,014,630
POWER STEERING PUMP

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 475,783, June 3, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,068
Int. Cl.² F04B *49/00*
U.S. Cl. 417—283 14 Claims



1. A vehicle power-steering pump for supplying fluid to a power-steering system, said pump comprising,

a housing having an inlet and an outlet and defining a pumping chamber,

pumping means in said pumping chamber operable to pump fluid from said inlet to said outlet, said pumping means including pumping elements which define a series of pumping pockets which expand and contract to effect pumping of fluid,

means for providing an increasing fluid flow to the system in proportion to increases in pump speed during a first range of pump speed and for providing a substantially constant flow of fluid to the system during a second range of pump speed immediately following said first range, said means comprising,

a cheek plate having a sealing position with one axial side thereof blocking fluid communication between said pumping pockets during said first speed range with the pressure in said outlet acting to urge said cheek plate out of sealing position,

means defining a cavity on the other axial side of said cheek plate,

means defining a passage directing fluid from said outlet to said cavity, the pressure in said cavity urging said cheek plate toward sealing position,

valve means including a valve member movable to vent said cavity upon said pump reaching said second speed range and operable to control the pressure in said cavity during said second speed range to enable the forces on said cheek plate to move said cheek plate and create a fluid bypass across said one axial side of said cheek plate from said outlet to said inlet, and

means for stabilizing said valve member by creating a fluid flow past said valve member during venting of said cavity by said valve member.

4,014,631

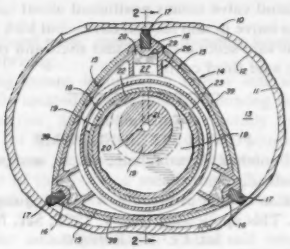
HEAT PIPE COOLING OF A ROTARY ENGINE ROTOR

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1975, Ser. No. 636,783

Int. Cl.² F01C *21/06*; F04C *29/04*

U.S. Cl. 418—85 **3 Claims**



1. In a rotary engine hollow rotor defined by arciform side walls converging to a plurality of angularly spaced outer apices, improved structure for cooling said rotor, comprising:

heat transfer means within the rotor comprising a rigid tubular wall concentrically within said side walls and having inwardly opening circumferentially extending helical groove means and outwardly opening circumferentially extending groove means;

heat pipe means extending inwardly from each of said apices to said heat transfer means and provided with a vaporizable fluid for transferring heat inwardly from said apices to said heat transfer means within said outwardly opening grooves means for apical cooling of said rotor; and

means for flowing a lubricant heat transfer fluid in the helical path defined by said inwardly opening groove means.

4,014,632

PNEUMATIC TIRE MOLD

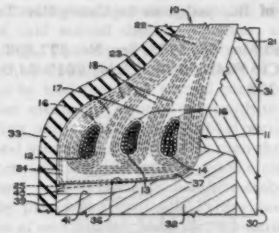
Reinhard Heinz Golz, and William James Johnson, both of Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 14, 1976, Ser. No. 695,944

Int. Cl.² B29H *5/02*

U.S. Cl. 425—28 R **7 Claims**

1. In a pneumatic tire mold having an annular bead molding ring, said bead molding ring comprising a toe edge for positioning adjacent a bladder, a toe portion adjacent said toe edge, and an annular bead flat surface for shaping a bead area of a tire, the improvement wherein said toe portion comprises



support means projecting radially outwardly from said flat bead surface.

4,014,633

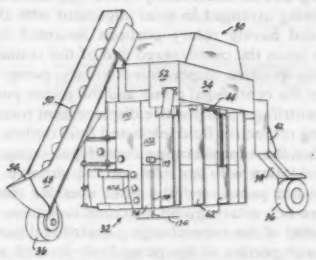
ADJUSTABLE SLIP FORM

Roy Robert Goughnour, Mason, Mich., assignor to A. C. Aukerman Co., Jackson, Mich.

Division of Ser. No. 268,159, June 30, 1972, Pat. No. 3,792,133. This application July 5, 1973, Ser. No. 376,718

Int. Cl.² B28B *13/02*

U.S. Cl. 425—63 **7 Claims**



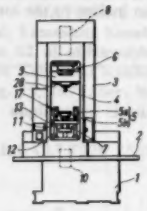
1. A slip form for continuously molding concrete highway barrier walls having exposed, spaced, vertically extending, contoured walls having a top comprising, in combination, a support member adapted to be mounted upon a movable vehicle, said support member including spaced, first and second lateral portions, first and second sidewalls mounted on said first and second lateral portions, respectively, for relative vertical adjustment with respect to each other, said first and second sidewalls each including lower portions adjustably supported for vertical movement in a path of adjustment upon said first and second lateral portions, said first and second sidewalls each including contoured upper portions mounted upon said first and second lateral portions, disposed adjacent and substantially parallel to the path of adjustment of said adjustable lower portions and selectively vertically adjustable thereto and selectively connectible to the associated lateral portion or lower portion, locking means selectively connecting said upper portions to said associated lateral portion or lower portion, and means mounted on said support member connected to said adjustable sidewall lower portions for adjusting the vertical position thereof.

4,014,634

POWDER MOLDING PRESS

Masayuki Hoshino, Shizuokaken, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed May 26, 1976, Ser. No. 690,180
Int. Cl.² B30B 15/18
U.S. Cl. 425—78 10 Claims



1. A compression-molding press comprising:
a machine frame;
a first metal mold securing device slideably secured to said machine frame;
a second metal mold securing device secured to said machine frame;
a driving means for slideably advancing said first metal mold securing device towards said second metal mold securing device;
a first metal mold coupled to said first metal mold securing device;
a second metal mold coupled to said second metal mold securing device;
stopper means, positioned between said first and second metal mold securing devices, and impinging upon one of said metal mold securing devices when said first metal mold securing device is advanced a predetermined distance toward said second metal mold securing device;
detecting means positioned between said stopper means and said one of said metal mold securing devices for detecting impingement of said stopper means upon said on of said metal mold securing devices; and
a means, included in said detecting means, for cutting off said driving means advancing said first metal mold securing device towards said second metal mold securing device, upon detection of impingement by said detecting means, thereby preventing a strong driving force acting on said impinging stopper means and said one of said metal mold securing devices, saving said stopper means and said one of said metal mold securing devices from breakage and deformation.

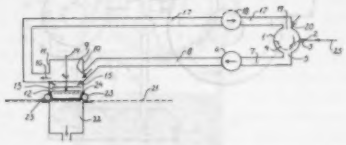
4,014,635

APPARATUS FOR THE DEPOSITION OF A UNIFORM LAYER OF DRY FIBRES ON A FORAMINOUS FORMING SURFACE

Karl Kristian Kobs Kroyer, Banegardsplads 4, DK-8100 Arhus C., Denmark

Filed Oct. 29, 1975, Ser. No. 626,973
Claims priority, application United Kingdom, Oct. 31, 1974, 47182/74
Int. Cl.² B29C 13/00; B29J 5/00
U.S. Cl. 425—82 8 Claims

1. An apparatus for the deposition of a uniform layer of dry fibres on a foraminous forming surface, said apparatus comprising in combination:
1. a hammer mill comprising a lower perforated wall, inlet means for fibrous material to be disintegrated, and inlet means for recycled fibrous material;
2. a conduit for transporting disintegrated fibrous material from the hammer mill to a fibre distributor;
3. a fibre distributor comprising a housing having a perforated plane-surfaced bottom wall, at least one stirring device having at least one impeller disposed for rotation a short distance above and in non-contacting relationship with the upper surface of said perforated bottom wall, at least one plate member located above said impeller and extending inwardly from the inside of the side walls of the housing so as to form a partition between a lower part and



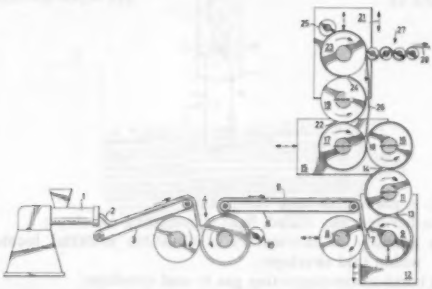
an upper part of said housing, inlet means for disintegrated material opening into said upper part of the housing, said upper part of the housing also comprising outlet means for fibrous material to be recycled to the hammer mill; and
4. a conduit connecting the outlet means of said housing with said inlet means of said hammer mill.

4,014,636

SYNTHETIC PLASTICS FILM MANUFACTURING PLANT INCLUDING A MULTIPLE-ROLL CALENDER

Werner Pawelczyk, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed Dec. 19, 1975, Ser. No. 642,442
Claims priority, application Germany, Dec. 21, 1974, 2460873
Int. Cl.² B29D 7/14
U.S. Cl. 425—224 3 Claims



1. Synthetic plastics film manufacturing plant comprising a multiple-roll calender and material feed means for charging the multiple-roll calender, wherein the multiple-roll calender has seven rolls comprising four bottom rolls disposed in an L-shape, one of which of said four bottom rolls, provided in the foot of the L, is an input feed roll, and three rolls disposed one above the other with their axes disposed substantially in the same vertical plane, the lowest roll of said three other rolls being disposed in a horizontal juxtaposition and in rolling contact with the topmost roll of said four bottom rolls and on the same side thereof as said input feed roll.

4,014,637

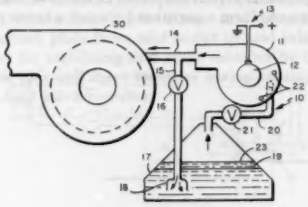
CATALYST GENERATOR

Kenneth R. Schena, Silvermine Road, West Boxford, Mass. 01855

Filed Mar. 1, 1976, Ser. No. 662,829
Int. Cl.² F23J 7/00
U.S. Cl. 431—4 11 Claims

1. Apparatus for supplying catalyst to the blower of a liquid fuel combustion device, comprising gas impeller means for

moving gas under pressure, a first conduit means connecting the output of the gas impeller means to the blower, second conduit means connected to said first conduit means at one end, and connected at the other end to a chamber means for



contact of the gas carried by said second conduit means with a liquid, and third conduit means connected between said chamber means and said gas impeller means for feeding the gas treated in said chamber means into said gas impeller means.

4,014,638

PHOTOFLASH LAMP WITH ELECTROSTATIC PROTECTION AND METHOD OF MAKING PHOTOFLASH UNITS

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Nov. 10, 1975, Ser. No. 630,581
Int. Cl.² A23L *1/20*
U.S. Cl. 431—95 R **4 Claims**

1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a quantity of filamentary combustible material located within said envelope;
a combustion-supporting gas in said envelope;
an ignition means disposed in said envelope in operative relationship with respect to said filamentary combustible material, said ignition means including a pair of lead-in wires extending into said envelope in a spaced relationship, said pair of lead-in wires comprising the two legs of a generally hairpin-shaped wire, a mass of primer material bridging said lead-in wires within said envelope, and the bight of said hairpin-shaped wire being outside of said envelope for electrically interconnecting the external portions of said pair of lead-in wires to effect a short circuit thereacross, whereby the lamp is disabled until ready for assembly or use.

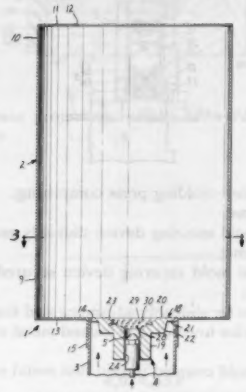
4,014,639

RECIRCULATING VORTEX BURNER

Harold E. Froehlich, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1975, Ser. No. 566,712
Int. Cl.² F23D *15/02*
U.S. Cl. 431—353 **11 Claims**

1. A recirculating vortex burner comprising in combination:
a substantially cylindrical combustion chamber having an intake port forming a portion of one end and at least one exhaust port at or near an opposite end;
a conduit means leading to the intake port of said chamber;
a swirl member disposed in the intake port of the combustion chamber to restrict air flow from said conduit means to said chamber, said swirl member having a central opening and a plurality of spaced apart inlet orifices circumferentially disposed around said opening and directed through said swirl member tangentially to said opening and at an incline to the longitudinal axis of said



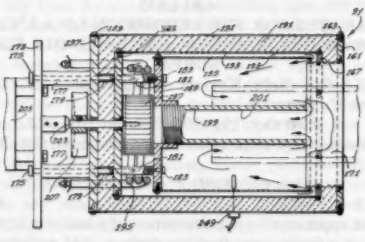
central opening to communicate between said conduit means and said combustion chamber whereby air can be directed through said orifices in said swirl member into said combustion chamber; and
a fuel nozzle disposed in the central opening of said swirl member for providing a conical fuel spray that intersects the air flow entering said combustion chamber through said swirl member orifices, said fuel nozzle and said swirl member cooperating together to seal off the intake port of said combustion chamber whereby air from said conduit enters said chamber solely through said orifices.

4,014,640

PIPE BELLING AND CHAMFERING MACHINE

Vernon V. Emery, Sun Valley; Charles W. Howe, Pasadena, and Joseph Marcella, Sun Valley, all of Calif., assignors to Vern Emery Company, Inc., Pacoima, Calif.

Division of Ser. No. 62,100, Aug. 7, 1970, Pat. No. 3,923,443.
This application Oct. 16, 1975, Ser. No. 622,814
Int. Cl.² F27D *5/00*; F24J *3/00*
U.S. Cl. 432—10 **3 Claims**



1. The method of heating an end of a length of pipe to be belled comprising the steps of
passing air from the exhaust side of a fan across heating coils,
heating the air as it crosses the heating coils,
passing the heated air over the outer surface of the wall of an end of the length of pipe,

turning the heated air as it flows past the end of the length of pipe,

passing the heated air over the inner surface of the wall of the end of the length of pipe, and

returning the heated air to the suction side of the fan.

4,014,641

APPARATUS FOR CALCINING POWDERED CEMENT MATERIAL

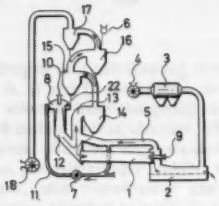
Miyamoto Shigeyoshi; Yamashita Kosuke; Fujiwara Kunihisa, and Utsumi Tatsuo, 02, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 604,910

Claims priority, application Japan, Sept. 30, 1974, 49-112550

Int. Cl.² F27B *15/00*

U.S. Cl. 432—58 **8 Claims**



1. Apparatus for calcining powdered cement material comprising: a kiln having an entrance; a suspension preheater including a plurality of cyclones arranged in vertical juxtaposition with at least a lowermost and a second lowermost cyclone being provided, said cyclones operating to separate cement material from gases when a mixture thereof is introduced therein, said lowermost cyclone having an upper inlet and a lower outlet connected to said kiln to introduce separated cement material thereinto; a gas duct connected at one end to the entrance of said kiln and at its opposite end to said upper inlet of said lowermost cyclone; a gas producer located beneath said second lowermost cyclone and having a bottom opening into said gas duct at a point below where said opposite end of said gas duct is connected to said upper inlet of said lowermost cyclone; means for supplying cement material from said second lowermost cyclone to said gas producer; means for supplying fuel and primary air to said gas producer; and secondary air supplying means located adjacent the point where said bottom of said gas producer opens into said gas duct.

4,014,642

SHAFT COOLER

Bernd Helming, Enniger, Germany, assignor to Polysius AG, Neubeckum, Germany

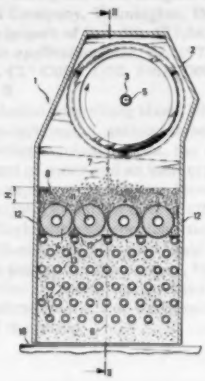
Filed Jan. 21, 1976, Ser. No. 650,847

Claims priority, application Germany, Feb. 5, 1975, 2504782

Int. Cl.² F27D *15/02*

U.S. Cl. 432—77 **10 Claims**

1. A shaft cooler comprising a plurality of power-driven adjacent horizontal hollow perforated comminuting rolls, a material — holding upper shaft section immediately above said rolls, said upper section having a height of 50 to 100 cm., means for delivering material at the upper end of said upper section, an aftercooling shaft section immediately below said rolls, the height of which is several times that of the upper section, means for withdrawing material at the lower end of said aftercooling section as material is delivered at the upper end of the upper section, thereby maintaining both sections substantially full of material, means in the aftercooling section for indirectly cooling the material, and means for supplying cooling air to the interior of each roll, thereby causing the air



to flow upward through the layer of material in the upper shaft section.

4,014,643

ROTARY KILN

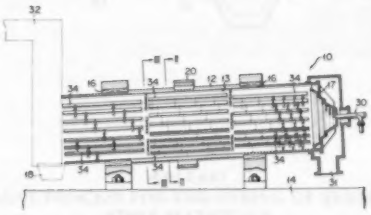
Keijiro Musha, Matsudo, and Hajime Maeda, Yokohama, both of Japan, assignors to Almer Sangyo Kaisha, Ltd., Tokyo, Japan

Filed June 9, 1975, Ser. No. 585,122

Claims priority, application Japan, July 15, 1974, 49-80907

Int. Cl.² F27B *7/18*

U.S. Cl. 432—118 **12 Claims**



1. A rotary kiln comprising a rotary drum having a throwing-in port, the rotary drum being rotated while a heated gas is passed therethrough for drying a slurry or the like containing therein water and thown through the throwing-in port of the rotary drum, wherein said rotary drum includes a large number of lifters which are disposed in a manner circumferentially spaced from each other and extending axially of the rotary drum along the inner wall thereof, the lifters having bent end portions projecting internally of the rotary drum and being bent in the rotational direction of the rotary drum, and wherein the rotary drum further includes a large number of metal-made chain-like first fittings attached to the bent end portion of each of said lifters, said first fittings having a length at least as great as the maximum distance between the bent end portion of one of said lifters and the lower face of another lifter adjacent said one lifter in the direction of the drum rotation but less than the distance between the bent end portions of said one lifter and said adjacent lifter, so as to prevent the first fitting of said one lifter from becoming entangled with the bent end portion of said adjacent lifter while permitting sliding movements by the first fitting of said one lifter on the lower face of said adjacent lifter.

4,014,644

TOLANE COMPOUNDS

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

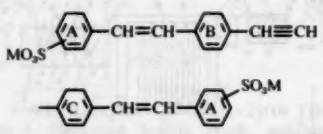
Filed June 10, 1975, Ser. No. 585,543

Claims priority, application Switzerland, June 12, 1974, 8031/74; June 12, 1974, 8037/74

Int. Cl.² D06P *1/38*

U.S. Cl. 8—1 W 6 Claims

1. A tolane compound of the formula



wherein

M denotes hydrogen or a salt-forming cation and the benzene nuclei A, B and C can contain non-chromophoric substituents selected from the group consisting of alkyl having 1 to 4 carbon atoms, chlorine, alkoxy having 1 to 4 carbon atoms, phenoxy, alkylmercapto having 1 to 4 carbon atoms, phenylmercapto, sulpho, trimethylene and tetramethylene, said trimethylene and tetramethylene substituents being attached to two adjacent carbon atoms of the benzenoid ring.

4. In a process for optically brightening organic materials, the improvement which comprises incorporating in the materials to be optically brightened or applying to the surface of the materials to be optically brightened a tolane compound as defined in claim 1.

4,014,645

DYEABLE POLYOLEFIN BACKING FOR TUFTED SURFACE COVERINGS

Francis X. Chancler, Southampton, and Vincent J. Moser, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

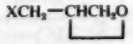
Filed Oct. 8, 1975, Ser. No. 620,904

Int. Cl.² D06P *7/00*

U.S. Cl. 8—17 18 Claims

1. As a surface covering, a dyed carpet or upholstery fabric comprising a polyolefin backing material having a polymeric coating thereon, and face yarns tufted to said backing, said coating being selected from:

A. homopolymers and copolymers of a quaternary monomer prepared by reacting an epihalohydrin of the formula



with an amine salt of the formula $H_2C{=}C(R)C(O)O{-}A{-}N(CH_3)_2{\cdot}HY$; and

B. the reaction product of homopolymers or copolymers of said amine salt and said epihalohydrin;

wherein R is hydrogen or methyl, X is iodine, bromine or chlorine, A is a (C_2-C_6) alkylene group having at least two carbon atoms in a chain between adjoined O and N atoms or A may be a polyoxyethylene group of the formula $(CH_2CH_2O)_xCH_2CH_2$ wherein x is at least 1, and Y is an anion.

4,014,646

HARD WATER-TOLERANT DYE SOLUTIONS

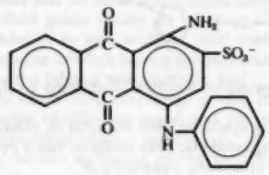
Victor Tullio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 473,662, May 28, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,470

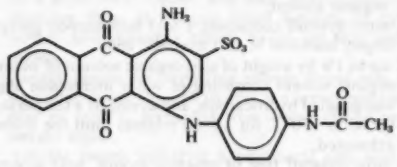
Int. Cl.² C09B *1/00, 5/62;* D06P *1/20*

U.S. Cl. 8—39 R 7 Claims

1. In a dye solution comprising about 10% to 20% by weight of anionic monosulfonated anthraquinone dye, the cations including alkanolammonium cations, the dye being dissolved in a mixed solvent of water and an inert organic cosolvent, the improvement comprising the addition thereto of about 0.03 to 0.20 part by weight, per part of dye, of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, or N-hydroxyethylethylenediaminetriacetic acid, said dye solution containing no more than about 0.2 percent, based on total weight of the dye solution, of cations other than alkanolammonium cations, the anthraquinone dye being selected from at least one member of the group



and



4,014,647

EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC FIBRE MATERIALS

Rütger Neeff, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 416,867, Nov. 19, 1973, which is a continuation of Ser. No. 161,282, July 9, 1971, abandoned. This application Feb. 14, 1975, Ser. No. 549,899

Claims priority, application Germany, July 10, 1970, 2034264; May 18, 1971, 2124495; May 18, 1971, 2124496

The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.² D06P *1/68, 5/00;* C09B *5/62*

U.S. Cl. 8—174 7 Claims

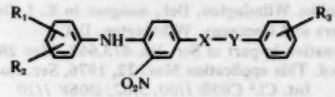
1. A process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

A. organic solvent;

B. nitro dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and

C. up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogenated hydrocarbon; and dyeing at a temperature of 60° to 170° C for 10–60 minutes until the dyebath is exhausted;

said nitro dyestuff free of reactive groups, acid groups and carboxamide groups having the formula



in which

R_1 means hydrogen, a halogen atom, a trifluoro, cyano, hydroxy, C_1–C_4-alkyl or -alkoxy, a hydromethyl or -ethyl, a hydroxy-ethylene-oxy, acylamino, alkylsulphonylamino, alkylsulphone, carboxamido, aminosulphonylalkylene-amino or sulphonamide group;

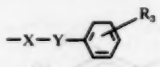
R_2 means hydrogen or a C_1–C_4-alkoxy group;

R_3 means hydrogen, a halogen atom, a hydroxy, hydroxyethylene-oxy, carboxamido, aminosulphonyl-alkylene-oxy or sulphonamide group;

X stands for the group $-SO_2-$ or $-CO$; and

Y stands for $-NH-$ or $-O-$,

with the proviso that one of the radicals R_1, R_3 or



is a sulphonamide group or a radical containing a sulphonamide group.

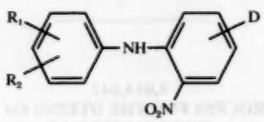
3. Process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

A. organic solvent;

B. nitro dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and

C. up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogenated hydrocarbon; and dyeing at a temperature of 60° C to 170° C for 10–60 minutes until the dyebath is exhausted;

said nitro dyestuff free of reactive groups, acid groups and carboxamide groups having the formula



in which

R_1 means hydrogen, a C_1–C_4-alkyl or -alkoxy group, halogen, a trifluoromethyl, nitro, hydroxymethyl, hydroxyethyl, phenyl, phenoxy, phenylazo, benzyloxy, carboxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-acylamino, C_1–C_4-alkylsulphonyl or sulphonamide group;

R_2 means hydrogen, halogen or a C_1–C_4-alkoxy group; and D means a sulphonamide group.

4,014,648

IN-LINE FLOCK CUTTING PROCESS

David I. Walsh, Barrnington, R.I.; James P. Casey, Seekonk, Mass.; George E. Corneau, Central Falls, R.I., and William F. Laird, Kingston, Canada, assignors to Microfibres, Inc., Pawtucket, R.I.

Filed Nov. 8, 1974, Ser. No. 522,044

Int. Cl.² D06B *15/00;* **D06L** *1/22;* **D06M** *9/00*

U.S. Cl. 8—138 **8 Claims**

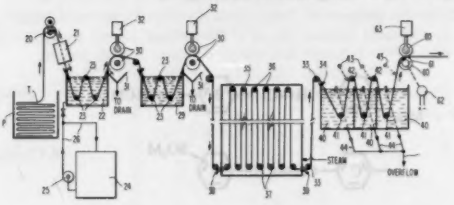
1. In a continuous in-line method for making flock from a tow selected from the group consisting of rayon, nylon, polyester and acrylic which comprises a plurality of filaments and which contains a lubricant which is detrimental to said flock, the steps which comprises:

a. continuously feeding the tow and said lubricant as a running tow,

b. continuously scouring said tow by contacting it with a liquid scouring agent for removal of said lubricant from said tow,

c. continuously squeezing excess scouring liquid from said tow,

d. continuously rinsing said tow with water,



e. continuously applying a predetermined pressure to squeeze excess rinse water from said rinsed tow,

f. continuously applying a liquid finish to said tow,

g. continuously applying another predetermined pressure of from about 60 to 100 lbs./square inch to said tow to remove a portion of the applied finish,

h. continuouslycutting the resulting tow into flock,

i. continuously drying the resulting wet flock wherein the drying step is controlled to moisture regain values of:

	% Regain	
	AC Flocking	DC Flocking
for rayon	6 – 8	10 – 12
for nylon	2 – 2.4	3 – 5
for polyester	1 – 2	1 – 2
for acrylic	1 – 2	1 – 2

to produce a moist, hot air by-product, and wherein said by-product is continuously diverted from said flock,

j. continuously beating the resultant dried flock with the admission of air, wherein the temperature of said admitted air is below about 100° F, and

k. packaging the flock.

4,014,649

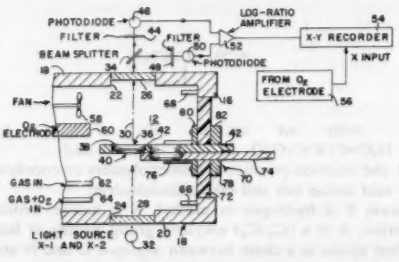
METHOD AND APPARATUS FOR DELIVERING BLOOD OXYGEN ASSOCIATION CURVE INFORMATION

Lutz A. Kiesow, Bethesda, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1976, Ser. No. 675,703

Int. Cl.² G01N *21/24, 33/16*

U.S. Cl. 23—230 B **7 Claims**



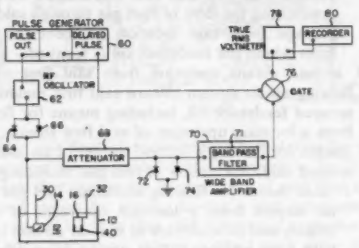
1. Method of measuring the oxygen association state of blood samples, which includes the steps of disposing a blood

sample within a blood-receiving receptable, providing a controlled atmosphere chamber, incubating said sample by placing it in the chamber and controlling said atmosphere therein so as to maintain the humidity, temperature, and carbon dioxide content of the atmosphere at substantially constant levels, and thereafter analyzing the sample by changing the concentration of oxygen in said chamber from time to time while observing the changes of oxygen association of the sample with respect to the concentration of oxygen within the chamber.

4,014,650
ULTRASONIC COAGULATION TIMER

Rubens A. Sigelmann, Seattle, Wash., assignor to Research Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,507
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **17 Claims**



1. A method of measuring the coagulation time of a solution containing whole blood or blood plasma, comprising:
directing ultrasound toward said solution and receiving the scattered ultrasound;
mixing a predetermined quantity of thrombin with said solution;
examining the scattered ultrasound for an indication that said solution has coagulated; and
measuring the elapsed tine between the mixing of thrombin with said solution and the coagulation of said solution.

4,014,651
METHOD FOR DETERMINING THYROID FUNCTION AND REAGENT COMPOSITION THEREFOR

Ella M. Bettinger, St. Louis, Mo., and Everett K. Mincey, Vancouver, Canada, assignors to Mallinckrodt, Inc., St. Louis, Mo.

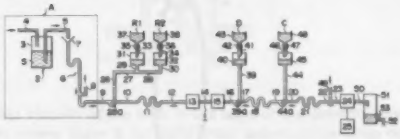
Continuation-in-part of Ser. No. 360,660, May 14, 1973, abandoned. This application May 15, 1975, Ser. No. 577,859
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230.6 **6 Claims**

1. A diagnostic reagent composition for use in the in vitro determination of thyroid function comprising a buffered aqueous suspension containing:
a. finely divided, amorphous silicon dioxide;
b. a thyroid hormone substance tagged with radioactive iodine; and
c. a nonionic surfactant;
the weight to weight ratio of said amorphous silica to said nonionic surfactant being in the range of approximately 10:1 to 50:1.

4,014,652
AUTOMATIC ANALYTIC APPARATUS OF LIQUIDS

Wataru Ishibashi, Kunitachi; Shigenobu Taira, and Ken Migita, both of Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 18, 1975, Ser. No. 614,763
Claims priority, application Japan, Sept. 27, 1974, 49-111055; Dec. 26, 1974, 50-148373; Dec. 27, 1974, 50-532
Int. Cl.² G01N *1/10, 33/00*
U.S. Cl. 23—253 R **10 Claims**



1. An automatic analytic apparatus of liquids comprising:
A. an analyzer for analyzing a liquid sample and having an inlet and an outlet for a liquid sample;
B. fluid guide means for guiding a liquid sample therethrough to said analyzer, said quide means including a tubular conduit having an inlet and an outlet connected to the inlet of said analyzer; and
C. a batch flow-generating device for forming a flowing series of alternate liquid and gas batches each having a prescribed volume comprising:
a. tubular siphoning means for collecting liquid samples in a prescribed volume and then intermittently discharging them as integral liquid batches by siphon action, said siphoning means having an inlet and an outlet,
b. supply means for supplying sample liquid into said siphoning means through its inlet at a prescribed rate so that its inlet is prevented from being closed up by sample liquid,
c. tubular means including a peripheral side wall, an outlet and an inlet connected to the outlet of said siphoning means,
d. receptacle means for collecting liquid samples of prescribed volume, said receptacle means having an inlet connected to the outlet of said tubular means and an outlet connected to the inlet of said fluid guide means, and
e. branch tube means comprising a tube with first and second ends, the first end being connected to said peripheral side wall for fluid flow between said branch tube and said tubular means and said second end being open to a gas source whereby gas in prescribed volume may enter and occupy space within said tubular means between said first end connection and said tubular means inlet,
whereby gas of prescribed volume is interposed between liquid batches discharged by said tubular siphoning means thus causing a flowing series of alternate liquid and gas batches from said receptacle means to pass into the inlet of said fluid means.

4,014,653
MICRO-FILTER

Edward A. Gianos, Cos Cob, Conn.; H. Eric Hunter, Westwood, Calif., and Edgar A. Lazo-Wasem, New Canaan, Conn., assignors to Denver Chemical Manufacturing Company, Stamford, Conn.

Filed Dec. 26, 1974, Ser. No. 536,632
Int. Cl.² G01F *15/12*
U.S. Cl. 23—259 **5 Claims**

1. In a micro-filter for filtering microliter quantities of liquid which comprises a flow passageway having inlet and outlet portions and a middle portion, said outlet portion including an

orifice, means for holding filter material in the middle portion of said passageway, a bulb-type collapsible micro-syringe with a single terminal nozzle opening through which liquid is drawn into the bulb portion thereof and discharged therefrom, said inlet portion of said passageway and the nozzle being complementarily shaped so that the nozzle can be inserted into the inlet portion of the passageway in liquid tight engagement, whereby liquid from said micro-syringe can be forced into the

passageway by finger pressure and the pressure maintained until the desired amount of liquid has passed through the filter material, the improvement wherein the middle portion has a larger cross-section than the inlet, the outlet portion tapers from said middle portion to said orifice, and wherein the outlet portion of the passageway has a volume not greater than about fifty microliters and the diameter at the orifice thereof is not greater than about two millimeters.

4,014,654

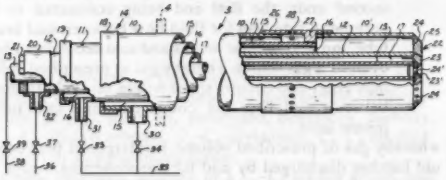
APPARATUS FOR PRODUCING CARBON BLACK

Ronald Lee Howell, Baytown, Tex., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 316,764, Dec. 20, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,323

Int. Cl.[2] C09C *1/48*; **F23C** *7/00*

U.S. Cl. 23—259.5 **6 Claims**



1. Apparatus for producing carbon black comprising:

I. a furnace having a chamber;

II. a burner assembly within said chamber including:

A. a plurality of co-extensive conduits including first, second and third conduits of successively smaller sizes, defining annular passages therebetween;

B. means for spraying feedstock oil into said chamber of said furnace, including means for mixing said feedstock oil with a vaporizing medium, including;

1. nozzle means at the end of said assembly within said chamber for spraying said feedstock oil and communicating with said third conduit, said conduit having an inlet remote from said nozzle,

2. means for mixing an atomizing medium with said feedstock oil including a fourth conduit within said third conduit and communicating with said nozzle,

3. means for flowing a vaporizing medium for said feedstock oil through said fourth conduit,

4. means for flowing said carbon black producing feedstock through the annulus between said third conduit and said fourth conduit;

C. first means for flowing a first stream of fuel gas around the sprayed feedstock oil from a location adjacent the location from which the feedstock oil is sprayed including a first passage means having an outlet adjacent said nozzle means for flowing fuel gas around the sprayed feedstock oil in an annular pattern and an inlet remote from said nozzle, said first means including:

1. a first, fuel gas outlet in close proximity to said nozzle and communicating with said first passage means comprising an annular passage between said second conduit and said third conduit, including a plurality of discharge ports extending around said nozzle,

2. means for flowing a fuel gas through said annulus between said second conduit and said third conduit,

3. means for separately controlling the flow of fuel gas from said first means forming said first stream, including first valve means connected to the annular passage between said first and second conduits for controlling the flow of fuel gas through said annular passage from said location adjacent the location from which the feedstock oil is sprayed;

D. second means upstream from said first means for flowing an air stream toward said first means and the sprayed feedstock oil, including means for flowing air from a location upstream of said first stream;

E. means for flowing a second stream of air and fuel gas around said first stream of fuel gas, including:

1. third means for flowing additional fuel gas into said air stream from a location upstream of said first stream and downstream of said air stream to mix air with said additional fuel gas to form said second stream,

a. said third means including a second passage means having an outlet upstream from said nozzle opening into said chamber for flowing fuel gas into said air stream and an inlet remote from said nozzle,

b. said third means being located between said first and second means and including a second fuel gas outlet means between said first outlet means and said inlet and remote from said first outlet means, said second fuel gas outlet means communicating with a second annular passage, said annular passage being between said first and second conduits and including a plurality of discharge ports extending around said burner assembly,

2. means for flowing a fuel gas through said annular passage between said first conduit and said second conduit; and

F. means for separately controlling the flow of said additional fuel gas from said third means into said air stream including second valve means connected to the annular passage between said second and third conduits for controlling the flow of fuel gas through said annular passage.

4,014,655

PLANT FOR CONTINUOUS PRODUCTION OF EXPLOSIVE CONTAINING EXPLOSIVE OIL

Bernt Brunnberg, Nora, Sweden, assignor to Nitro Nobel A.B., Gyttorp, Sweden

Filed Mar. 27, 1975, Ser. No. 562,662

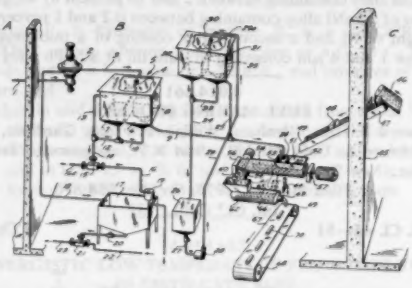
Claims priority, application Sweden, Apr. 10, 1974, 7404839

Int. Cl.[2] C06B *21/00*

U.S. Cl. 23—266 **12 Claims**

1. An apparatus for continuously producing explosive made up of a mixture of explosive liquid and solid ingredients com-

prising: a first station having means for storing emulsified explosive liquid, and first means for transporting said explosive liquid to a second station; a second station for mixing the explosive liquid and the solid ingredients; and a third station having a first means for mixing said solid ingredients, and second means for transporting said mixed solid ingredients from said third station to said second station, said second station being positioned between said first and third stations; said second station comprising means for separating said explosive liquid from the water contained therein, a second means for mixing said solid ingredients with said dewatered explosive liquid, said second means for mixing having a first inlet for receiving and storing said solid ingredients after having been transported to said second station by said second means for transporting of said third station, and a second inlet



spaced from said first inlet toward said first station for receiving and storing therein said dewatered explosive liquid delivered by said first means for transporting of said first station, said second means for mixing having a wall separating said first and second inlets so that said dewatered explosive liquid and said solid ingredients do not contact each other prior to being mixed, said second means for mixing further having a mixer mounted below said first and second inlets for mixing said solid ingredients and said explosive liquid delivered thereto from said first and second inlets, and said second station further comprising third means for transporting connected to said first and second means for transporting of said first and third stations, respectively, so that the dewatered explosive liquid and the solid ingredients may be supplied to said second and first inlets, respectively.

4,014,656

MONITORING DEVICE FOR CRYSTAL PULLING APPARATUS

Siegfried Leibenzeder, Erlangen, and Klaus-Dieter Schwarzmichel, Erlangen-Grossdechsendorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 30, 1974, Ser. No. 510,631

Claims priority, application Germany, Oct. 3, 1973, 2349736

Int. Cl.² B01J *17/18*

U.S. Cl. 23—273 SP **4 Claims**

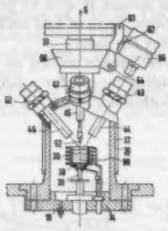
1. In a monitoring device for crystal pulling equipment in which crystals are pulled from a melt in a crucible disposed on a stand inside a high pressure drawing chamber and through the cover of which the drawing spindle of a crystal mount is led and in which the equipment stand, the high pressure drawing chamber and crystal mount are disposed one above each other symmetrical to the drawing axis, the upper portion of the high pressure drawing chamber forming a bulb which is provided with a plurality of observation windows which may be viewed using a common television camera the improvement in said observation windows comprising:

a. a cooled tapped nipple in the drawing chamber;

b. a high pressure-tight mount inserted in said cooled tapped nipple;

c. a high pressure window sealed in the outside end of said mount; and

d. a quartz rod sealed into said mount and extending through the inside end thereof, said quartz rod projecting freely into the drawing chamber with its end in the imme-



diate vicinity of the melt in the zone of the drawing chamber where there is no substantial temperature drop relative to the temperature of the melt.

4,014,657

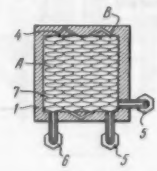
CATALYTIC-REACTOR FOR CARRYING OUT CONJUGATE CHEMICAL REACTIONS

Vladimir Mikhailovich Gryaznov, Leninskie gory M.G.U. zona L, kv. 11; Viktor Sergeevich Smirnov, Kutuzovsky prospekt 26, kv. 555; Alexandr Petrovich Mischenko, Khersonskaya ulitsa 7, korpus 4, kv. 515, and Sergei Ivanovich Aladyshev, ulitsa Grimau 7/2, korpus 4, kv. 77, all of Moscow, U.S.S.R.

Filed May 25, 1972, Ser. No. 256,935

Int. Cl.² B01J *8/00*

U.S. Cl. 23—288 R **1 Claim**



1. A catalytic reactor for carrying out conjugate chemical reactions, comrising a hollow body of rectangular cross-section covers for said body and a plurality of thin membranes within said body arranged parallel to one another and made of a material selectively permeable to hydrogen and having catalytic activity with respect to the conjugated reactions, said membranes being made in the form of plates whose edges are hermetically sealed into the body and covers of the reactor and which separate the reactor space into two groups of chambers interconnected in an alternate pattern by V-shaped channels formed in the side walls of the body, each group of said chambers having pipes for feeding in initial reactant and removing reaction products respectively and said plates being corrugated with a corrugation of one plate located opposite and bearing against the nearest corrugation of the adjacent plate.

4,014,658

SOLVENT VAPOR VENTING DUST COVER UNIT FOR FRACTION COLLECTOR TURNTABLE

David Lloyd Arendsen, Libertyville, and Carl William Nordeen, McHenry, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 572,696

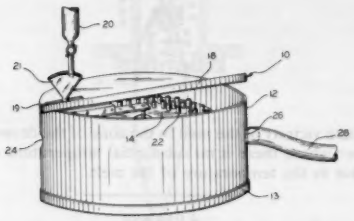
Int. Cl.² B01L *1/00*

U.S. Cl. 23—292 **3 Claims**

1. A solvent vapor venting dust cover unit for a fraction collector turntable comprising:

enclosure means housing said fraction collector turntable;

said fraction collector turntable having a base plate;
said enclosure means supported on said base plate;
removable cover means positioned over and in a abutting relationship with said enclosure means, and wherein said removable cover means is split to provide two separate and distinct sections, each of said sections having a rolled edge and an offset lap joint;
said removable cover means having an opening therein;
said opening providing means for a solvent to be dropped into test tubes within said fraction collector turntable;



said enclosure means having spaced apart air intake means and air exhaust means;
said air exhaust means including an outwardly extending hose extending from said air exhaust means and said hose being connectable to an adjacent hood whereby air flow is drawn out of said unit through said air exhaust means through a ventilation system within said hood; and
said air intake means and said air exhaust means located opposite each other in said enclosure whereby any solvent vapors within said enclosure means are drawn out of said enclosure means.

4,014,659

IMPREGNATED COMPOUND METAL AS CONTACT MATERIAL FOR VACUUM SWITCHES AND METHOD FOR ITS MANUFACTURE

Heinrich Hassler, Wendelstein, and Horst Kippenberg, Nurnberg-Weiherhaus, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,678

Claims priority, application Germany, Nov. 16, 1973, 2357333

Int. Cl.² B22F *3/00, 1/04;* C22C *33/02*

U.S. Cl. 29—182.1 **5 Claims**

1. Impregnated compound metal as a contact material for vacuum switches, comprising a sintered metal matrix impregnated with an impregnating metal or impregnating metal alloy, the melting point of said metal matrix being higher than that of the impregnating metal or alloy, wherein the metal matrix comprises a metallic main constituent having a melting point above 1400° C and a metallic embrittlement additive; wherein brittle, intermetallic phases or mixed crystals are formed between said metallic main constituent and said embrittlement additive at temperatures above about 1200° C; wherein the embrittlement additive comprises between 0.5 and 10 weight-percent relative to the main constituent; wherein the melting point of the impregnating metal or alloy is between 850° C and the sintering temperature of said matrix; and wherein the boiling points of the main constituent, embrittlement metal or alloy and impregnating substance are above 2000° C, based on a pressure of 760 Torr.

4,014,660

HOT-TINNED WIRE FOR ELECTROTECHNICAL PURPOSES AND METHOD FOR ITS PRODUCTION

Horst Schreiner, Nurnberg, and Dieter Friedrich, Wendelstein, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,680

Claims priority, application Germany, Nov. 12, 1973, 2356351

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B32B *15/00;* C23C *1/04*

U.S. Cl. 29—183.5 **5 Claims**

1. A hot-tinned wire of copper or copper alloys having a two-later coating of tin or tin alloys, wherein the first inner coating is of a thickness between 0.5 and 2 μm and consists of a SnBi alloy containing between 2 and 10 percent by weight of Bi or of a SnNi alloy containing between 0.2 and 1 percent by weight of Ni and a second outer coating of a thickness between 1 and 4 μm consisting of pure tin or a SnPb alloy.

4,014,661

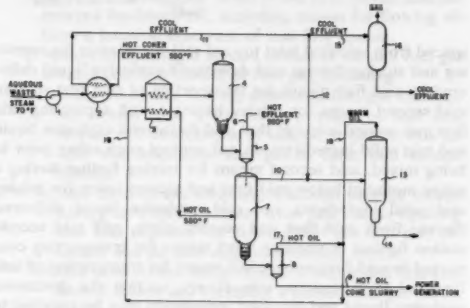
FUEL MAKING PROCESS

Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,870

Int. Cl.² C10L *1/32*

U.S. Cl. 44—51 **5 Claims**



1. A process for producing a coke-containing fuel, comprising coking a carbonaceous material in the liquid phase under a pressure of 300 to 3200 psig at a temperature of 400° to 700° F for 0.5 minutes to 3 hours to form gases, hot liquid and liquid-containing coke; separating said coke from said liquid and gases; drying said coke by extraction with a combustible hydrocarbon under a pressure of between 300 and 3200 psig at a temperature of between 400° and 700° F to remove said liquid from said coke and form a hydrocarbon solution of water and a dense slurry of dry coke in said hydrocarbon suitable for burning.

4,014,662

POLYMER COMBINATIONS USEFUL IN FUEL OIL TO IMPROVE COLD FLOW PROPERTIES

Harold N. Miller, Millington, and Max J. Wisotsky, Highland Park, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 616,753, Sept. 19, 1975, abandoned. This application Oct. 10, 1975, Ser. No. 621,462

Int. Cl.² C10L *1/24*

U.S. Cl. 44—62 **8 Claims**

1. A distillate petroleum fuel oil boiling in the range of 120° to 480° C. of which about at least 5 wt. % boils above 350° C., which has been improved in its low temperature flow properties, containing in the range of about 0.005 to 0.1 wt. %, based on the weight of the total composition, of a flow improving synergistic combination of (a) one part by weight of ann oil

soluble ethylene backbone middle distillate pour point depressing polymer having a number average molecular weight in the range of about 1000 to 60,000 per (b) 0.2 to 5 parts by weight of an oil-soluble sulfone copolymer having a number average molecular weight in the range of about 800 to 500,000;

wherein said ethylene backbone polymer consists essentially of 3 to 40 molar proportions of ethylene copolymerized with a molar proportion of ethylenically unsaturated alkyl ester of the formula:

wherein R_1 is hydrogen or methyl; R_2 is a $-OOCR_4$ or $-COOR_4$ group wherein R_4 is hydrogen or a C_1 to C_8 alkyl group, and R_3 is hydrogen or $-COOR_4$, and mixtures of said esters; and

wherein said sulfone copolymer comprises from about 50 to about 70 mole % of C_2 to C_{50} substantially linear olefins and from about 30 to about 50 mole % of sulfur dioxide, and at least 25 wt. % of said sulfone copolymer is in the form of substantially linear C_{10} to C_{20} alkyl groups.

4,014,663

SYNERGISTIC LOW TEMPERATURE FLOW IMPROVER IN DISTILLATE FUEL

Nicholas Feldman, Woodbridge, and Arthur W. Langer, Jr., Watchung, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

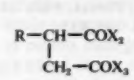
Continuation-in-part of Ser. No. 517,162, Oct. 23, 1974, abandoned, which is a continuation of Ser. No. 427,802, Dec. 26, 1973, abandoned. This application Nov. 28, 1975, Ser. No. 635,846

Int. Cl.² C10L 1/22

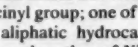
U.S. Cl. 44—71 **14 Claims**

1. A petroleum middle distillate fuel which has been improved with respect to its low temperature flow properties by adding thereto a minor amount of a flow improving additive combination of synergistic proportions of:

A. a hydrocarbyl succinamic acid material of the formula:



wherein R is a straight chain aliphatic hydrocarbon having from 0 to 1 site of olefinic unsaturation and from 14 to 40 carbon atoms and attached at a secondary carbon atom to the succinyl group; one of X^2 and X^3 is $-NYY^1$, wherein Y and Y^1 are aliphatic hydrocarbyl groups of from 14 to 28 carbon atoms, the other of X^2 and X^3 is of the formula:



wherein n varies from 0 to 1, Y^2 and Y^3 are hydrogen, aliphatic hydrocarbon of from 1 to 30 carbon atoms or oxyaliphatic hydrocarbon of from 1 to 30 carbon atoms, and may be taken together with the nitrogen to which they are attached to form a heterocyclic ring of from 5 to 7 annular members; and

B. a derivative of an alpha olefin selected from the group consisting of:

1. a dimer of an alpha olefin that has from 16 to 40 carbon atoms;
2. a polymer of dimer (1);
3. An aromatic compound that has been alkylated with dimer (1); and
4. an aromatic compound that has been alkylated with an alpha olefin having from 16 to 50 carbon atoms;

said aromatic compound that is alkylated under (3) or (4) being selected from aromatic hydrocarbons having from 1 to 3 benzene rings, from 0 to 3 alkyl groups of from 1 to 20 carbon atoms each, and from 0 to 3 other substituents per ring, said other substituents being selected from the group consisting of COOR, OR, NR_2, F, Cl, Br and NO_2 wherein R is alkyl of 1 to 20 carbon atoms, phenyl or alkylated phenyl having 1 to 2 alkyl groups totalling 1 to 20 carbon atoms;

the relative weight ratios of the additives in the combination ranging from 0.01 to 10 parts by weight of B per part by weight of A.

4,014,664

REACTOR FOR THE PRESSURE GASIFICATION OF COAL

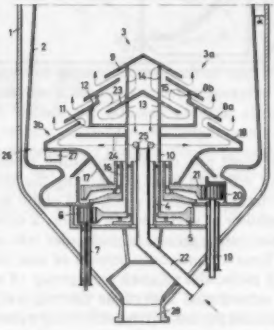
Hans Küpfer; Paul Lange, both of Frankfurt am Main, and Paul Rudolph, Bad Homburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 10, 1975, Ser. No. 622,182

Claims priority, application Germany, June 3, 1975, 2524445

Int. Cl.² C10J 3/16, 3/42

U.S. Cl. 48—63 **5 Claims**



1. A closed reactor for the gasification of coal with oxygen and water vapor as gasifying agents at elevated temperature and under pressures of 5 – 100 bars, comprising water-cooled jacket means, said jacket means defining an inner shell surrounding the gasification zone of the reactor, rotary grate means in said gasification zone for moving the material to be gasified, an ash lock beneath said rotary grate means for receiving ash remaining from the material after gasification, said rotary grate means being provided with feed conduits for receiving gasifying agents and with apertures for the passage of the gasifying agents into the gasifying zone, said rotary grate means being composed of two concentric parts, driving means for rotating each grate part independently of the other, the outer diameter of the inner part of the grate being 0.5 to 0.8 times the inside diameter of the inner shell adjacent to the rotary grate means, and scraping means attached to the outer part of said rotary means the movement of the grate parts assisting the movement of ash formed upon gasification, the rotation of the scraping means with the outer grate part scraping ash from inside the reactor to the ash lock.

4,014,665

MEMBRANE PROCESS AND PRODUCT

Edward F. Steigelmann, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 7, 1974, Ser. No. 512,972

Int. Cl.² C07C 11/12

U.S. Cl. 55—16 **16 Claims**

1. A membrane-liquid barrier system, comprising an essentially solid, water-insoluble, semi-permeable membrane film

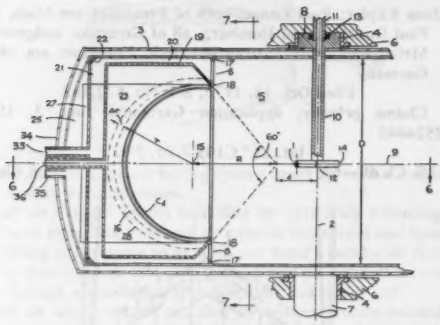
and an aqueous liquid barrier in contact with said film, said liquid barrier having dissolved therein a complex-forming, silver-containing ion component having silver essentially in solution, and hydrogen peroxide in an amount sufficient to retard reduction of the ions in said ion component.

4,014,666

SEPARATION OF GASES

Chia-Gee Wang, Peekskill, N.Y., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 514,679, Oct. 15, 1974, abandoned. This application Nov. 29, 1974, Ser. No. 528,128
Int. Cl.² B01D *45/14*
U.S. Cl. 55—17 **11 Claims**



1. A time of flight process for separating gaseous mixtures of molecules of different mass comprising the steps of:

causing a rotating means to eject, in a plane normal to the axis of rotation of said rotating means, a contiguous plurality of successive groups of molecules into an evacuated space to form a continuous stream of said mixture;

allowing the molecules of each said group of molecules to move in accordance with their thermal velocities for a predetermined period of time following ejection, thereby to allow each said group of molecules to form a generally spherical configuration the outer radius of which will be enriched, in molecules of lighter mass, relative to lesser radii; and

using a collector means co-rotating with said rotating means to collect molecules, which have been allowed to move for said predetermined period of time in accordance with their thermal velocities, from at least one desired portion of said stream, said collector means also serving as a pump to evacuate said evacuated space.

4,014,667

ANTIFREEZE RECOVERY SYSTEM

Franklin T. Barber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 16, 1975, Ser. No. 587,180
Int. Cl.² B01D *3/38*
U.S. Cl. 55—32 **7 Claims**

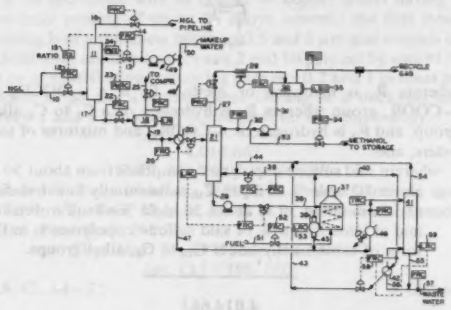
1. A process for the recovery of methanol used as an antifreeze agent in hydrocarbon-containing streams which also contain moisture and have a tendency to form hydrates and ice which comprises

a. contacting said stream containing moisture and methanol with water in an extraction zone under liquid-liquid extraction conditions to separate a bottoms stream comprising water and methanol and an overhead hydrocarbon-containing stream substantially free of the methanol,

b. passing said bottoms stream separated in (a) to a fractionation zone having direct reboiler heat and operated under conditions sufficient to separate methanol overhead as product for reuse and a bottoms water stream containing residual amounts of methanol,

c. heating said bottoms water stream obtained in (b) to an elevated temperature and then flashing same under conditions to vaporize controlled quantities of said heated bottoms and form a vapor stream comprising steam and residual amounts of methanol and a liquid stream comprising water and residual amounts of methanol,

d. passing a portion of the vapor thus formed directly to said fractionation zone in (b) as at least a portion of said direct reboiler heat and utilizing the remainder of said vapor stream as an indirect source of reboiler heat for a stripping zone and then passing same to said fractionation zone in (b) as at least a part of said direct reboiler heat,



e. recycling a portion of said liquid water stream containing residual amounts of methanol obtained in (c) to said extraction zone in (a) for said contacting and passing the remainder of said liquid water stream to a stripping zone,

f. subjecting the remainder of said liquid water stream in (e) to stripping conditions to said stripping zone so as to remove as bottoms a water stream substantially free of methanol for reuse or safe disposal, as desired, and an overhead vapor stream comprising methanol, and

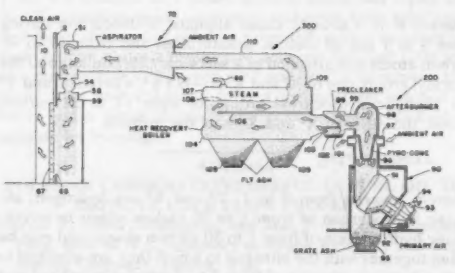
g. passing said overhead vapor stream obtained in (f) directly to said fractionation zone as at least a part of said direct reboiler heat therefor.

4,014,668

WASTE DISPOSAL STRUCTURE AND SYSTEM

C. George Riester, 10397 S. Lake Blvd., Parma, Ohio 44130

Filed June 5, 1972, Ser. No. 259,835
Int. Cl.² B01D *47/12*
U.S. Cl. 55—90 **22 Claims**



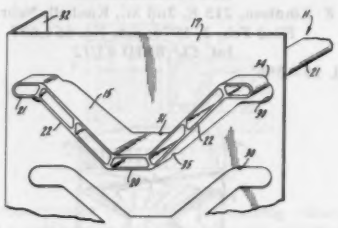
1. A method for disposing of trash within a building of the type including a downwardly sloping roof at least partly supported on a hollow central support and a plenum chamber beneath the roof separated from the main building chamber, comprising the steps of: processing trash within said main building chamber, burning the trash within the main building chamber to produce waste gases, directing said gases through said central support to said plenum chamber, and discharging the gases from said plenum chamber to atmosphere through openings in the roof.

6. A building for enclosing and forming part of a trash disposal system comprising: a hollow central core, a roof extending downwardly and outwardly from said central core, said roof including overlapping sections which overlap in a direction outwardly from said central core and having generally vertical gaps between the overlapped end portions thereof, separating means spaced downwardly from said roof for separating a main building chamber from a plenum chamber beneath said roof, and exhaust passage means for exhausting gases produced in said main building chamber through said central core to said plenum chamber for exhaust to atmosphere through said gaps.

4,014,669
SELF-LOCKING DRIFT ELIMINATOR

Stanley E. Thompson, and Joseph Michael Schwinn, both of Healdsburg, Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed Dec. 24, 1975, Ser. No. 644,273
Int. Cl.² B01D *45/06*
U.S. Cl. 55—257 PV **10 Claims**



1. A liquid cooling tower having means for delivering liquid and for causing such liquid to fall within said tower, an air inlet, an air outlet, means for causing air to flow from said inlet to said outlet so as to intersect the liquid falling within the tower, and an improved drift eliminator assembly within the tower that removes droplets of liquid entrained in the air before discharge of the air through said outlet, comprising:

a. a plurality of longitudinally extending drift eliminator blades of predetermined cross-sectional shape made from a resilient material that is sufficiently rigid to enable each blade to support its own weight, yet is sufficiently flexible to permit each blade to be deflected into a temporary, distorted shape during attachment in said assembly, and each blade having notches therein;

b. support means of rigid material for receiving said blades having slots that are larger than said cross-sectional shape so as to permit passing of a blade through each slot when such blade is deflected into said temporary, distorted shape; and

c. said notches being aligned with and receiving the material defining said slots so as to form an interference fit between said support means and said blades upon return of said blades toward said predetermined shape after deformation and insertion of said blades through said slots.

4,014,670
HAZARD NEUTRALIZING CONTAINER

Arch L. Young, El Segundo, Calif., assignor to A & J Manufacturing Co., Los Angeles, Calif.

Filed Jan. 22, 1976, Ser. No. 651,656
Int. Cl.² B01D *53/04*
U.S. Cl. 55—274 **9 Claims**

1. An apparatus for containing and neutralizing the harmful effects of a hazardous material, comprising:

a rigid housing adapted to receive the hazardous material, said housing having a pair of double walls;

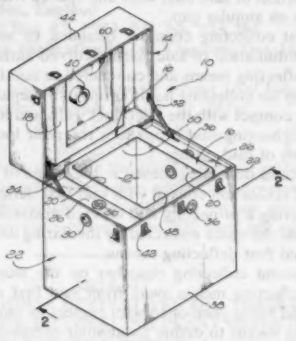
a filter medium container mounted between each pair of double walls;

a filter medium packed within said medium containers, said filter medium being adapted to neutralize the harmful effects of the hazardous material to be inserted in the housing;

a vent from the top of each filter medium container to the interior of the housing;

a vent from the bottom of each filter medium container to the atmosphere;

means for closing and hermetically sealing said housing except for said vents; and

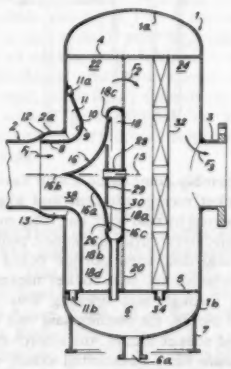


a one way valve connected to each of said bottom vents to the atmosphere, said valves being operable only when the pressure within the housing exceeds atmospheric pressure, whereby unconfined hazardous material escapes to the atmosphere only through the filter medium contained within the filter medium containers thereby neutralizing the harmful effects of the hazardous material prior to such material escaping to the atmosphere.

4,014,671
DEVICE FOR SEPARATING DROPS OF LIQUID CONTAINED IN A GAS STREAM

Jean Andro, La Celle St-Cloud, and Jean-Pierre Peyrelongue, Issy-les-Moulineaux, both of France, assignors to Stein Industrie S.A., Velizy-Villacoublay, France

Filed June 19, 1975, Ser. No. 588,621
Claims priority, application France, June 21, 1974, 74.21612
Int. Cl.² B01D *50/00*
U.S. Cl. 55—325 **7 Claims**



1. A device for separating drops of a liquid contained in a gas stream, comprising:

a closed casing provided with a horizontal inlet duct for the introduction of a gas stream to be treated and an outlet

duct for the discharge of the treated gas stream, the interior of said casing being divided by a vertical grid into a first compartment into which said inlet duct has its opening and a second compartment in a wall of which said outlet duct is provided;

said inlet duct being connected to said casing by an enlarged terminal portion of said inlet duct;

a first deflecting means having flaring curved surfaces in coaxial alignment with said inlet duct and having its upstream end in tubular shape, located in said enlarged portion of said inlet duct and spaced from said inlet duct by an annular gap;

a first collecting chamber bounded by said casing and a continuation of said flaring curved surfaces of said first deflecting means and connected to said inlet duct by said gap for collecting liquid drops to be separated which flow in contact with the inlet duct walls and having a drain for discharging said drops to a reservoir located at the bottom of said casing;

a second deflecting means in the shape of a flaring surface of revolution coaxial with said first deflection means and having a projecting and tapered upstream end projecting into the space encircled by the flaring downstream end of said first deflecting means;

a second collecting chamber on the side of said second deflecting means away from said first deflecting means and being positioned with respect to said second deflecting means to define an annular entrance slit adjacent to the downstream end of said second deflecting means, for collecting drops flowing off said second deflecting means and having a drain for discharging the collected drops of liquid to said reservoir;

and fine-separation means located in said second compartment and interposed between said grid and said outlet duct.

4,014,672

GAS FILTER TUBE LOCKING APPARATUS

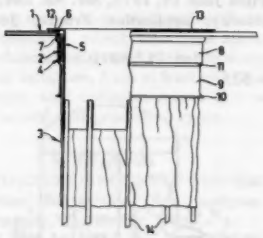
Staffan Jansson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 8, 1976, Ser. No. 647,306

Claims priority, application Sweden, Jan. 13, 1975, 7500294

Int. Cl.² B01D *46/00*

U.S. Cl. 55—357 **10 Claims**



1. In a filter assembly comprising a wall having an opening therethrough; socket means adjacent and aligned with said opening and supported by said wall; bag filter means having an open end and a circumferential thickened portion extending about said end; said thickened portion being positioned in, and around the interior of, said socket means; and tubular means extending through said opening into said open end inside said socket means, for holding said end between it and the interior of said socket means, the improvement wherein:

said tubular means has a substantial axially-extending portion and is slidably insertable into, and slidably removable from, said end of said bag filter means while it is positioned within said socket means,

said tubular means comprises stop means extending radially outwardly of said opening above said wall for limiting the extent of insertion thereof into said end, and gripping means on said tubular means for inserting and removing said tubular means,

the interior of said socket means having a section, located adjacent the axially-inner end of said thickened portion of said bag means, which section converges toward the exterior of said axially-extending portion of said tubular means, along the direction toward the other end of said bag filter means, so that tensioning of said bag filter means wedges said thickened portion into said converging section to form a substantially gas-tight seal.

4,014,673

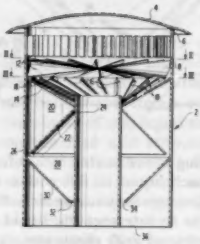
AIR PRECLEANER

Daniel E. Kinnison, 215 E. 2nd St., Kimball, Nebr. 69145

Filed Feb. 2, 1976, Ser. No. 654,697

Int. Cl.² B01D *45/12*

U.S. Cl. 55—396 **5 Claims**



1. An air pre-cleaner for use with an internal combustion engine, said pre-cleaner comprising:

a. a housing having an inlet in the upper portion thereof adapted to admit air to be cleaned, and an outlet in the lower portion thereof;

b. vane means mounted within the upper portion of said housing below the inlet for imparting a circular motion to air entering the inlet and passing downwardly through said vane means, such that heavy particles in said air are projected from the axis of said housing by the centrifugal force thereon caused by the circular motion;

c. tube means positioned within said housing below said vane means, said tube means defining an axial passage through the central and lower portions of said housing;

d. separator means positioned within said housing between the wall of said housing and said tube means, and below said vane means, said separator means having a plurality of louver means therein, wherein the heavy particles in said air pass through said louver means, fall away from said separator means under the influence of gravity, and exit said housing through the outlet therein; and

e. control means positioned in said housing between said separator means and the outlet for limiting the upward flow of air through the outlet, into said housing, and toward said separator means whereby air entering said outlet will not restrict the separation of heavy particles from the inlet air in said separator means so that air entering the inlet will pass through said vane means as a circular flow into said separator means wherein the heavy particles separated therein will fall through the outlet and the cleaned air will be directed through said tube means for use in said internal combustion engine.

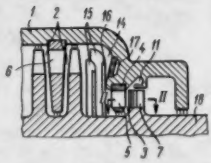
4,014,674
TURBOEXPANDER

Ivan Ivanovich Kirillov, ulitsa Politekhnicheskaya, 29, 2 korpus, kv. 67, Leningrad; Alexandr Petrovich Agishev, ulitsa Danilevskogo, 32a, kv. 14, Kharkov; Vladimir Nikolaevich Ameljushkin, ulitsa Dekabristov, 58/28, kv. 6, Leningrad; Sabir Yakubovich Bogdanovich, prospekt Lenina, 41/43, kv. 156, Knarkov; Chingiz Saibovich Guseinov, Krasnoshkolnaya naberezhnaya, 18, kv. 249, Kharkov; Valentin Valentinovich Medvedev, ulitsa Zernovaya, 53a, kv. 33, Kharkov; Igor Petrovich Faddeev, prospekt Raevskogo, 9, kv. 35, and Viktor Sergeevich Rozin, ulitsa Korzuna, 5, kv. 204, both of Leningrad, all of U.S.S.R.

Continuation of Ser. No. 543,545, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 445,791, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 292,837, Sept. 27, 1972, abandoned. This application Dec. 5, 1975, Ser. No. 638,053

Int. Cl.² F25J *3/06*

U.S. Cl. 62—38 **7 Claims**



1. A turboexpander preferably for cooling natural gas, comprising a casing set on a shaft; at least one operating stage with blades, which is arranged on the shaft in said casing; at least one separating stage arranged on the shaft in said casing in the direction of the gas-liquid flow; a guiding device with blades, which is provided in said separating stage, the blade pitch being smaller than that of said operating stage; a runner arranged in succession with said guiding device in said separating stage, the profile of the blades of said guiding device having an extended inlet portion; said inlet portion of the blade having spouts provided on its back; said casing being provided with a ring chamber disposed along the periphery of said runner, said ring chamber having a slit for collection of the separated liquid and a branch pipe located in the lower part of said casing.

4,014,675
FERTILIZER STICK

George E. Osburn, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 5, 1974, Ser. No. 529,645

Int. Cl.² C05C *9/02*

U.S. Cl. 71—28 **8 Claims**

1. A fertilizer stick consisting essentially of water-soluble hydroxypropyl cellulose having an M.S. of 2–10 and dispersed therein about 10 to about 80% by weight of fertilizer material, based on the weight of the total composition, said stick having substantially the same cross-sectional area throughout its length except for the end portion adapted to be inserted into the soil.

4,014,676
WATER TREATMENT FOR CONTROLLING THE GROWTH OF ALGAE EMPLOYING BIGUANIDES

Graham Carter, and Anthony John Hinton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 17, 1973, Ser. No. 425,285

Claims priority, application United Kingdom, Dec. 18, 1972, 58289/72

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² A01N *9/20*

U.S. Cl. 71—67 **3 Claims**

1. A method for controlling the growth of algae in the water of swimming pools which comprises adding to the water poly(-hexamethylene biguanide) hydrochloride, in an amount to provide a concentration of from 1 to 200 parts per million.

4,014,677
5-NITROPYRIMIDINE DERIVATIVES AND THEIR USE IN AGENTS FOR INFLUENCING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

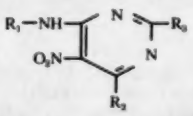
Filed May 7, 1975, Ser. No. 575,308

Claims priority, application Switzerland, May 10, 1974, 6426/74

Int. Cl.² A01N *9/22*; C07D *239/30*

U.S. Cl. 71—92 **8 Claims**

1. A 5-nitro-pyrimidine derivative of the formula I



(I)

wherein R_1 represents an alkyl radical of 2 to 7 carbon atoms, an alkenyl radical of 3 to 5 carbon atoms, or a cycloalkyl radical of 3 to 6 carbon atoms, R_2 represents an alkyl radical of 2 to 6 carbon atoms, an alkoxy or an alkylthio radical of 1 to 6 carbon atoms, an alkenyloxy or alkenylthio radical of 2 to 4 carbon atoms, a cyloalkoxy or cycloalkylthio radical of 3 to 6 carbon atoms, R_3 represents hydrogen, an alkyl, haloalkyl, alkoxy or alkylthio radical of 1 to 4 carbon atoms or a di-(C_1–C_4-alkyl)-amino radical, and the addition salts thereof with inorganic or organic acids selected from the group consisting of hydrochloric acid, hydrobromic acid, phosphoric acid, sulfuric acid, nitric acid, fluoroboric acid, perchloric acid, methyl sulfuric acid, ethylsulfuric acid, halobenzoic acids, trichloroacetic acid, methane sulphonic acid and p-toluene sulfonic acid.

4,014,678
1-(3,7-DIMETHYLOCTYL)-1(2-PROPENYL)-AND 1(2-PROPYNYL)-PIPERIDINIUM BROMIDES AS PLANT GROWTH REGULANTS

Gerhard Huppi, Gockhausen; Wijitha De Silva, Schofflisdorf, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 9, 1974, Ser. No. 531,134

Claims priority, application Switzerland, Dec. 14, 1973, 17546/73

Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 **4 Claims**

1. A composition for the regulation of plant growth containing an effective amount of 1-(3,7-dimethyloctyl)-1-(2-

propenyl)piperidinium bromide, in association with a compatible agriculturally acceptable carrier.

4,014,679

NOVEL CROTONANILIDES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

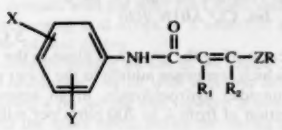
Continuation-in-part of Ser. No. 398,415, Sept. 18, 1973, abandoned. This application May 30, 1975, Ser. No. 582,270

Claims priority, application France, Apr. 16, 1975, 75.11784; Sept. 26, 1972, 72.33960

Int. Cl.² C07C *103/133, 103/365, 103/76*

U.S. Cl. 71—118 **17 Claims**

1. A crotonanilide of the formula



wherein Z is selected from the group consisting of —O— and —S—, R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and phenyl, X and Y are individually selected from the group consisting of hydrogen, halogen, lower alkyl of 1 to 6 carbon atoms optionally subsituted with at least one halogen, alkoxy of 1 to 3 carbon atoms, alkylthio and alkylsulfinyl of 1 to 6 carbon atoms, acyl of an organic carboxylic acid of 1 to 6 carbon atoms, $-NO_2$ and $-CF_3$, R_1 is selected from the group consisting of hydrogen, chloride, bromine, alkoxycarbonyl with 1 to 6 alkyl carbon atoms, nitro and alkylthio, alkylsulfinyl and alkylsulfonyl of 1 to 3 alkyl carbon atoms and R_2 is alkyl of 1 to 6 carbon atoms, said compounds existing in the form of their E or Z isomers or mixtures thereof.

4,014,680

PREALLOYED STAINLESS STEEL POWDER FOR LIQUID PHASE SINTERING

Orville W. Reen, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 542,986, Jan. 22, 1975, Pat. No. 3,980,444. This application June 25, 1976, Ser. No. 699,827

Int. Cl.² C22C *33/02, 38/44, 38/54*

U.S. Cl. 75—.5 BA **4 Claims**

1. A pre-alloyed stainless steel powder consisting essentially of, by weight, up to 0.05% carbon, 22 to 26% chromium, 10 to 24% nickel, 2.7 to 5% molybdenum, 0.1 to 1% boron, up to 2.0% manganese, up to 2.0% silicon, balance iron and residuals.

4,014,681

VEHICLE RECYCLING PROCESS

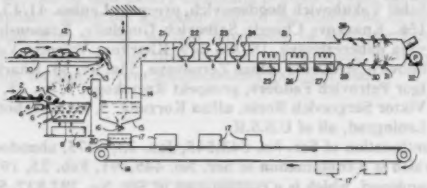
Paul E. Rhinehart, P.O. Box 184, Mountain Falls Rt., Winchester, Va. 22601

Division of Ser. No. 478,377, June 11, 1974, Pat. No. 3,917,239. This application Mar. 5, 1975, Ser. No. 555,577

Int. Cl.² C21C *5/52*

U.S. Cl. 75—12 **10 Claims**

1. A method for recovering distinct products from scrap vehicles, said vehicles comprising steel vehicle bodies, nonferrous and cast iron vehicle parts, combustible materials including tires and noncombustible materials including glass, which comprises stripping and separating said parts, tires and glass from said scrap bodies to obtain a stripped steel vehicle body, conveying said stripped vehicle bodies adjacent a furnace, burning a fuel in said furnace to produce a heated furnace gas as well as radiant heat which preliminarily heats said stripped body, further heating the preheated bodies in a cupola by means of said heated furnace gas to produce a steel melt and a slag, which are recovered therefrom, as well as a cupola exhaust gas, said exhaust gas from said furnace and said cupola combining to form a heated flue gas, drawing said heated flue gas through a substantially horizontal flue and in heat exchange relationship with a plurality of smelters and heat recovery units for recovering and using the heat from said



heated flue gas, introducing ambient air into the flue gas downstream of said heat recovery units to further reduce the temperature of said flue gas, subsequently scrubbing the flue gas with water to substantially remove any particulate matter disposed in the flue gas and exhausting the cooled and cleaned flue gas to the atmosphere.

4,014,682

PROCESS FOR THE PRODUCTION OF ELEMENTAL PHOSPHORUS AND IRON FROM PHOSPHATE ROCK

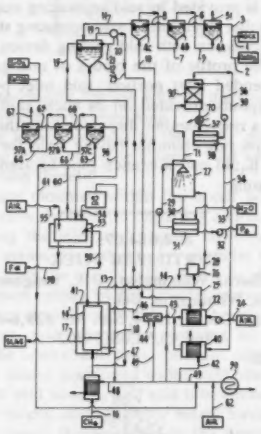
Edward Adam Majewski, Geelong, Australia, assignor to The Phosphate Co-operative Company of Australia Ltd., Melbourne, Australia

Continuation-in-part of Ser. No. 444,242, Feb. 20, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,883

Claims priority, application Australia, Feb. 14, 1974, 65625/74

Int. Cl.² C21B *3/04, 5/04*

U.S. Cl. 75—29 **11 Claims**



1. A process for the production of elemental phosphorus from low-grade phosphate rock containing at least 5% by weight of iron and at least 5% by weight aluminum calculated as ferric and aluminum oxides respectively as major impurities which comprises:

1. mixing the low-grade phosphate rock with calcium oxide as a flux additive, the amount of calcium oxide being sufficient to produce, after the reaction of step (2), a calcium aluminate slag composition which is liquid at the reaction temperature;
2. introducing the mixture of phosphate rock and calcium oxide simultaneously with a carbonaceous reductant into a reaction chamber and heating said mixture in said chamber at a temperature of from about 1400° C to about

1600° C, thereby to produce reaction products which are molten at said temperature and contain ferrophosphorus and said liquid calcium aluminate slag compositon and gaseous reaction products containing elemental phosphorus;

3. withdrawing said gaseous reaction products from the reaction chamber and recovering the elemental phosphorus from gaseous reaction products;
4. separately withdrawing said calcium aluminate slag composition and said ferrophosphorus from the reaction chamber and discarding the calcium aluminate slag composition;
5. transferring the molten ferrophosphorus to a recovery unit;
6. adding calcium oxide to the ferrophosphorus in the recovery unit and oxidizing the ferrophosphorus in the molten condition and in the presence of the calcium oxide, thereby to produce metallic iron and calcium phosphate;
7. withdrawing the metallic iron and the calcium phosphate separately from the recovery unit; and
8. recycling the calcium phosphate to the reaction chamber.

4,014,683

METHOD OF MAKING DRAWING QUALITY STEEL

Robert S. Miltenberger, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,213

Int. Cl.² C21C *7/00*

U.S. Cl. 75—49 **12 Claims**

1. A process for producing drawing quality steel having an exceedingly low carbon, aluminum and oxygen contents and consisting essentially of less than 0.02% carbon, less than 0.023% aluminum, less than 125 parts per million oxygen, less than 0.015% silicon, 0.20% to 0.35% manganese and the remainder iron and incidental impurities, the process comprising the steps of; preparing a heat of steel consisting essentially of not greater than 0.035% carbon, oxygen in an amount greater than 350 parts per million, less than 0.015% silicon, less than 0.20% manganese and the remainder iron and incidential impurities, adding to the heat a manganese addition to increase the manganese content of the steel in the range of 0.20% to 0.35%, vacuum degassing the molten steel, during vacuum degassing adding a non-silicon bearing deoxidizing agent consisting essentially of carbon, aluminum and the remainder binder and sinker substances and continuing the vacuum degassing after this addition, and wherein the amounts of carbon and aluminum added are limited such that the resulting steel after the vacuum degassing will contain carbon in an amount less than 0.02% and aluminum in an amount less than 0.023% while at the same time being sufficient to reduce the amount of oxygen to less than 125 parts per million.

4,014,684

MANUFACTURE OF STEEL

Evan Thomas Richard Jones, and Robert Anthony Fishburn, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Filed Nov. 14, 1974, Ser. No. 523,835

Claims priority, application United Kingdom, Nov. 27, 1973, 54995/73; Apr. 29, 1974, 18713/74

Int. Cl.² C21C *7/02;* **C22B** *9/10*

U.S. Cl. 75—51 **15 Claims**

1. A flux composition for use in desulphurising molten metal, which composition comprises, by weight, at least 60% of lime, from 1 to 20% of sodium carbonate, from 5 to 30% of a fluoride selected from alkali metal and alkaline earth metal fluorides and mixtures thereof, from 0 to less than 2% by weight of metallic reducing agent and from 5 to 20% of alumina.

4,014,685

MANUFACTURE OF STEEL

Evan Thomas Richard Jones, and Robert Anthony Fishburn, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Filed Nov. 14, 1974, Ser. No. 523,836

Claims priority, application United Kingdom, Nov. 27, 1973, 54996/73; Apr. 29, 1974, 18712/74

Int. Cl.² C21C *7/02;* **C22B** *9/10*

U.S. Cl. 75—51 **12 Claims**

1. A flux composition for use in desulphurising molten steel in a furnace, which composition comprises 50 to 80% by weight of lime, from 1–20% by weight of sodium carbonate, from 5–30% by weight of a fluoride selected from alkali metal and alkaline earth metal fluorides and mixtures thereof, 5–30% by weight of alumina and from 2–15% by weight of a metallic reducing agent.

4,014,686

DEOXIDATION OF OPEN TYPE STEELS FOR IMPROVED FORMABILITY

James G. Bassett, Jr., Franklin Township, Westmoreland County, and Saul Gilbert, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,568

Int. Cl.² C21C *7/02*

U.S. Cl. 75—58 **9 Claims**

1. In the manufacture of low carbon steel strands, wherein the precursor molten steel therefor is produced by "open" methods, in which the desired degree of mold rimming action is controlled by the addition of deoxidizers to the molten steel, both in the ladle and in the mold,

a method for improving the formability of said steel strands, in which the deoxidation in the ladle is effected by the addition of deoxidizers substantially devoid of Al and wherein the deoxidizer added to the mold consists essentially of Mg in an amount of 0.5 to 10 oz./ton of steel.

4,014,687

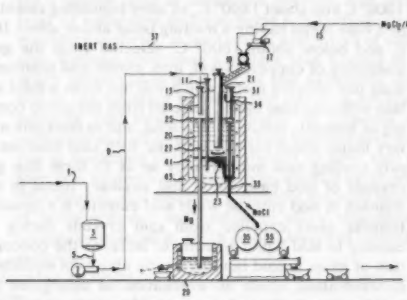
PROCESS FOR MAKING MAGNESIUM METAL

Norval D. Clare, Niagara Falls, N.Y., and Charles H. Lemke, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1976, Ser. No. 648,761

Int. Cl.² C22B *29/00*

U.S. Cl. 75—67 R **8 Claims**



1. A process for the manufacture of magnesium metal comprising

a. forming a pool of magma from $MgCl_2$ and NaCl, the surface of which is blanketed with inert gas and in which the weight ratio of $MgCl_2$ to NaCl is from about 0.5 to about 2;
b. injecting sodium metal beneath the surface of the magma; and
c. withdrawing molten magnesium metal from the surface of the magma.

4,014,688

CONTACT MATERIAL FOR HIGH-POWER VACUUM CIRCUIT BREAKERS

Horst Schreiner, Nurnberg, Austria, and Heinrich Hässler, Wendelstein, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 251,889, May 10, 1972, Pat. No. 3,948,652. This application Sept. 17, 1975, Ser. No. 614,225

Int. Cl.² C22C *38/12*

U.S. Cl. 75—123 B **3 Claims**

1. A contact material for high-power vacuum circuit breakers comprising an alloy consisting essentially of a base metal iron and at least one alloying metal bismuth, characterized by containing at least one auxiliary metal boron forming a eutectic with said base metal, said eutectic comprising about 15% to about 50% of the total volume of said alloy, said eutectic surrounding crystals consisting mainly of said base metal, said alloying metal being contained in said crystals and comprising not more than 5% by weight of said crystals and being dispersed in said eutectic to an extent of less than 5% by weight of said eutectic, and said alloy having an alloying formulation consisting essentially of 0.3% by weight of bismuth and 1% by weight of boron, with the balance being the iron base metal.

4,014,689

METHOD OF FABRICATING A CONTACT MATERIAL FOR HIGH-POWER VACUUM CIRCUIT BREAKERS

Schreiner Horst, Nurnberg, Austria, and Heinrich Hässler, Wendelstein, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 251,889, May 10, 1972, Pat. No. 3,948,652. This application Dec. 11, 1975, Ser. No. 639,708

Int. Cl.² C22C *1/02, 33/04*

U.S. Cl. 75—129 **5 Claims**

1. A method of fabricating a contact material for high-power vacuum circuit breakers, comprising the steps of:

melting under vacuum, at a temperature between about 1000° C and about 1800° C, an alloy consisting essentially of a base metal having a melting point above about 1000° C and below about 1800° C, selected from the group consisting of copper, nickel, iron, cobalt and titanium, at least one alloying metal which will not form a solid solution with said base metal, selected from the group consisting of bismuth, tellurium and lead, and at least one auxiliary metal which forms a eutectic with said base metal;

slowly cooling said molten alloy so as to form fine grain crystals of said base metal and auxiliary metal in solid solution in said eutectic while said eutectic is a liquid and transfer gases expelled from said crystals during said cooling to said liquid eutectic to increase the concentration of gases in said liquid eutectic above an equilibrium concentration, cause an evacuation of said gases from said liquid eutectic and remove said gases from said alloy, said eutectic comprising about 15 to about 50% of the total volume of said alloy, said eutectic surrounding said crystals and said crystals consisting mainly of said base metal, and

further cooling said alloy to rapidly solidify said liquid eutectic and precipitate said alloying metal as a fine dispersion in said eutectic, said alloying metal being contained in said crystals and comprising not more than 5% by weight of said crystals and being dispersed in said eutectic to an extent of less than 5% by weight of said eutectic.

4,014,690

GOLD-COLORED ALLOY SOLDERS

Ronald P. Dudek, River Grove; Peter Kosmos, Alsip, and John A. Tesk, Woodridge, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed May 14, 1976, Ser. No. 686,347

Int. Cl.² C22C *5/02*

U.S. Cl. 75—165 **5 Claims**

1. A gold-colored alloy solder consisting essentially of the following constituents in the indicated percentages by weight:

Constituent	Proportional Range
Gold	60 – 70%
Platinum	0 – 10%
Palladium	0 – 10%
Copper	10 – 25%
Gallium	5 – 10%
Iridium	0 – 0.01%

with the proviso that the total of said platinum and palladium is from about 5–10%.

4,014,691

DENTAL BRIDGE ALLOY

M. Hamdi A. Mohammed, 50 Ranger Lane, West Hartford, Conn. 06117

Continuation-in-part of Ser. No. 316,272, Dec. 18, 1972, abandoned. This application Mar. 22, 1974, Ser. No. 453,845

Int. Cl.² C22C *19/00*

U.S. Cl. 75—171 **8 Claims**

1. A highly ductile cobalt-chromium-nickel dental alloy having a ductility of about 20 percent or more elongation, a yield strength of about 35,000 or less and low work hardening characteristics suited for crown and bridge applications requiring deformation by hand burnishing in the mouth of a patient, said alloy having no more than 0.02 percent carbon and being essentially free of boron, molybdenum, titanium, aluminum and tungsten to prevent the formation of hardening precipitates thereof in the alloy and having an alloy base consisting essentially of, by weight, about 10 to 60 percent cobalt, 17 to 24 percent chromium, and 20 to 75 percent nickel as the essential major alloying elements, and an element of the group consisting of tantalum and niobium alloyed therewith to promote a high rate of crystallization and provide uniformity and fineness of crystal size, said alloying element being present in an amount of up to about 4 percent tantalum or an equivalent atomic weight of niobium.

4,014,692

PLATINUM-RHODIUM ALLOYS HAVING LOW CREEP RATES

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 9, 1976, Ser. No. 647,690

Int. Cl.² C22C *5/04*

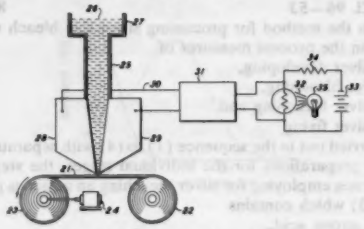
U.S. Cl. 75—172 R **9 Claims**

1. A composition consisting essentially of rhodium in an amount within the range of from about 10 to about 40 weight percent, boron in an amount within the range of from about 0.01 to about 0.5 weight percent, zirconium in an amount within the range of from about 0.015 to about 1.25 weight percent, the balance of said composition being platinum.

4,014,693
ELECTROVISCOUS RECORDING

Harold E. Clark, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 563,313, April 21, 1966, abandoned. This application May 1, 1972, Ser. No. 249,430
Int. Cl.² G03G *13/10, 13/22*
U.S. Cl. 96—1 R 5 Claims

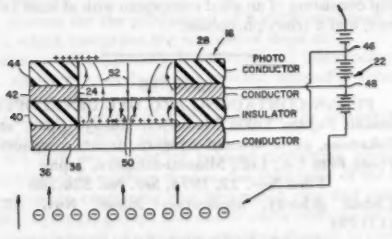


3. The method of recording information comprising the steps of: forming a latent electrostatic image on a xerographic member; providing colored electroviscous liquid for forming images; establishing electrical fields between said electrostatic image on said zerographic member and a conductive member and across said electroviscous liquid whereby the viscosity of said electroviscous liquid is varied in accordance with said latent electrostatic image, and effecting relative intermittent and recurrent movement in said electroviscous liquid to produce breaks in contact between said electroviscous liquid and the image areas between said zerographic and conductive members whereby electroviscous liquid is formed in image configuration on one of said members.

4,014,694
METHOD AND APPARATUS FOR FORMING A POSITIVE ELECTROSTATIC IMAGE

Hewitt D. Crane, Portola; Gerald L. Pressman, Cupertino, and George J. Eilers, Redwood City, all of Calif., assignors to Electroprint, Inc., Cupertino, Calif.

Division of Ser. No. 281,605, Aug. 17, 1972, Pat. No. 3,867,673. This application Feb. 18, 1975, Ser. No. 550,406
Int. Cl.² G03G *13/052*
U.S. Cl. 96—1 R 5 Claims



1. The method of electrostatic printing or copying which includes controlling the flow of electrostatically charged particles through apertures which comprises the steps of forming a first field within said apertures that is so polarized and of a magnitude sufficient to block passage of the flow of the electrostatically charged particles through the apertures, forming a second field within said apertures that has a polarity opposite from and a magnitude greater than said first field so as to counteract said first field within said apertures, selectively discharging said second field in accordance with the image to be printed or copied, and modulating the flow of the electrostatically charged particles in accordance with that image by passing them through the apertures.

4. A method for electrostatically modulating the flow of a stream of charged particles through a multi-layer apertured member comprising the steps of:

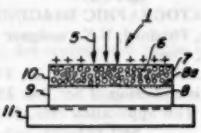
establishing a coplanar array of a first plurality of bipolar electrostatic fields substantially confined within the apertures of the apertured member, uniformly oriented, and having substantially uniform strength sufficient for blocking the flow of a stream of charged particles directed through the array;

and selectively superimposing over said first array a second coplanar array of a second plurality of bipolar electrostatic fields, said second fields being uniformly oriented in the opposite direction from said first plurality of fields, and having selected magnitude for selectively conteracting the first plurality of fields in the configuration of an image to be reproduced.

4,014,695
MIGRATION IMAGING METHOD EMPLOYING MIGRATION MEMBER HAVING A SURFACE SKIN

David A. Buckley, Rochester, and Frank G. Belli, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 499,716, Aug. 22, 1974, Pat. No. 3,979,210. This application July 23, 1975, Ser. No. 598,309
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 PS 12 Claims



1. A imaging method comprising:

a. providing an imaging member comprising:

a first layer of softenable material containing migration material, said first layer of softenable material overlaying a second layer of softenable material, said second layer of softenable material being substantially free of migration material, at least one of said layers of softenable material containing a surface skin located at the entire surface of at least one of said softenable layers and at the interface between said layers of softenable material, said surface skin formed by exposing said surface of at least one of said layers of softenable material to hardening radiation sufficient to form said surface skin having a thickness from about 0.01 to about 00.5 micron, said layers of softenable material capable of being softened sufficiently to allow migration of migration material in depth in said layers of softenable material;

b. forming an electrical latent image on said imaging member;

c. developing said imaging member softening both of said first and second layers of softenable material at least sufficient to allow imagewise migration of migration material at least in depth in both of said first and second layers of softenable layers whereby said migration material migrates in image configuration through said first layer of softenable material and said interface and in depth in said second layer of softenable material; and

d. removing unmigrated migration material by splitting said member at said interface.

4,014,696

MULTICOLORED XEROGRAPHIC TRANSPARENCY UTILIZING AN ALIPHATIC ESTER COATING

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 5, 1975, Ser. No. 547,295

Int. Cl.² G03G *13/16, 13/22*

U.S. Cl. 96—1.4 8 Claims

1. A method of xerographically preparing a color transparency copy comprising the sequence of:

a. forming a single color xerographic powder image of a multicolored original to be reproduced;

b. transferring the powder image to a transparency comprising a thermoplastic film sheet, said sheet having at least one surface having been coated with a nonvolatile long chain aliphatic ester having a melting point above 40° C wherein said long chain aliphatic ester is selected from the group consisting of glycol monostearate sorbitan tristearate, sorbitan monopalmitate, sorbitan monostearate, ethylene glycol monostearate and mixtures thereof; and

c. then, repeating said sequence in steps (a) and (b), where each sequence corresponds with the formation of a different color to effect multicolor reproduction, said transfer of each developed electrostatic image taking place in registration on the transparency;

d. fixing the powder image on the transparency.

4,014,697

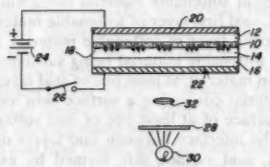
ELECTROSTATOGRAPHIC IMAGING MEMBER

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 392,599, Aug. 29, 1973, Pat. No. 3,890,040, which is a division of Ser. No. 212,220, Dec. 27, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 560,283

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 1 Claim



1. An electrostatographic imaging member comprising

a layer of transparent electrically insulating material carrying a thin film of transparent electrically conductive material which carries a thin film of transparent electrically insulating material which carries a layer of photoreceptor material;

a layer of developer material including electrophotographic marking particles residing on a substrate and arranged adjacent to said photoreceptor layer, said substrate including a layer of recording material carrying a thin layer of electrically conductive material which carries a thin layer of electrically insulating material, said developer material layer being adjacent said thin electrically insulating material layer of said substrate; and

means for establishing a blocking layer for inhibiting the exchange of electrical charge between said developing material and said photoreceptor material.

4,014,698

METHOD FOR PROCESSING SILVER DYE BLEACH MATERIALS

Max Marthaler, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed June 30, 1975, Ser. No. 591,803

Claims priority, application Switzerland, July 10, 1974, 9506/74

Int. Cl.² G03C *7/00*

U.S. Cl. 96—53 8 Claims

1. In the method for processing silver dye bleach material wherein the process measures of

1. silver developing,
2. dye bleaching,
3. silver bleaching and
4. silver fixing

are carried out in the sequence (1) to (4) with separate appropriate preparations for the individual stages, the step which comprises employing for silver bleaching an aqueous preparation (3) which contains

a. a strong acid,

b. a water-soluble iodide,

c. a water-soluble organic nitro compound,

d. a diazine compound in an amount of 0.2 to 5 gram per liter of preparation (3) and

e. an anti-oxidant, only preparation (3) containing a nitro compound.

4,014,699

PREPARATION FOR THE PROCESSING OF PHOTOGRAPHIC MATERIALS

Matthias Schellenberg; Christoph Chylewski, both of Marly, and Max Meier, Fribourg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 468,837, May 10, 1974, Pat. No. 3,957,516. This application Oct. 8, 1975, Ser. No. 620,677

Claims priority, application Switzerland, May 17, 1973, 7061/73

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.4 5 Claims

1. Liquid developer preparation for a photographic silver halide material, which substantially consists of an oil-in-water emulsion which comprises, in the aqueous phase as an active substance capable of exerting its action on the photographic material, at least one silver halide developing agent, and which further comprises in the oily phase an antioxidant which is sparingly soluble in the aqueous phase and selected from the group consisting of an alkyl mercaptan with at least 10 carbon atoms, and a triarylphosphine.

4,014,700

FURAN CONTAINING AZO DYE DEVELOPERS

Shinsaku Fujita; Yukio Maekawa; Kazuya Sano, and Seiki Sakanoue, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

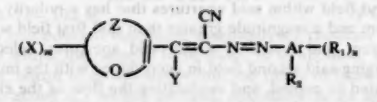
Filed Nov. 22, 1974, Ser. No. 526,188

Claims priority, application Japan, Nov. 22, 1973, 48-131494

Int. Cl.² G03C *7/00, 1/40, 1/76, 1/10*

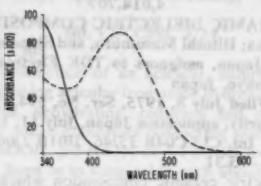
U.S. Cl. 96—73 12 Claims

1. A light-sensitive material for the diffusion transfer process comprising a support having coated thereon a blue-sensitive silver halide emulsion and an associated yellow dye developer represented by the following formula (1)



wherein X represents a hydrogen atom, a halogen atom, a

nitro group, a hydroxyl group, an alkyl group having 1 to 4 carbon atoms, or an acylamino group having 1 to 4 carbon atoms; Z represents an atomic group necessary for completing a furan ring or benzofuran ring; Y represents a hydroxyl group, an acyloxy group having 1 to 4 carbon atoms or an alkoxyacyloxy group having 2 to 4 carbon atoms; Ar represents an aromatic ring R_1 represents a hydrogen atom, a halogen atom, an acyl group having 1 to 4 carbon atoms, or an



alkyl group having 1 to 5 carbon atoms; R_2 represents a hydroxyl group, an acyloxy group having 1 to 4 carbon atoms, or an alkoxyacyloxy group having 2 to 4 carbon atoms; R_2 being at the ortho-position to the azo group; and *m* and *n* each represents an integer of 1 to 4; at least one of said Z and Ar being bonded directly or through an atom or divalent group to a polyhydric phenol moiety having a silver halide development activity.

4,014,701

PROCESS OF MAKING DIAZO-SENSITIZED FILM PRODUCTS USING HALOGEN CONTAINING PHENOLS AS COATING AID

Margaret Loudon Clachan; David Rankine Kennedy, both of Manningtree, England; Basil Robert Shephard, deceased, late of Manningtree, England, and by Doreen Shephard, executrix, Colchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 307,529, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 647,642, June 21, 1967, abandoned. This application Mar. 22, 1974, Ser. No. 453,960

Claims priority, application United Kingdom, June 27, 1966, 28738/66; Sept. 8, 1966, 40209/66

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² G03C *1/80, 1/52*

U.S. Cl. 96—75 **5 Claims**

1. A process for the production of a diazo-sensitised film product, which comprises the successive steps of:

I. treating a self-supporting film of synthetic linear polyester by applying to at least one surface thereof a solution consisting of:

i. a liquid solvent which is volatile in the temperature range 30°–120°C, and

ii. 0.5–20% by weight of halogen-containing phenolic substance in solution therein, the molecules of the said substance containing one benzenoid ring and one or two hydroxyl groups and one or more chlorine or bromine atoms all of which are attached directly to carbon atoms belonging to the benzenoid ring;

II. heating the treated film for 1–15 minutes at 30°–120°C to remove the volatile solvent;

III. superimposing on a treated surface of the film a layer consisting essentially of one of the following:

1. a vinyl chloride-vinyl acetate copolymer or partially hydrolysed vinyl chloride-vinyl acetate copolymer,

2. a vinylidene chloride-acrylonitrile copolymer or a copolymer of vinylidene chloride with an acrylic or methacrylic ester,

3. a polymer of acrylic or methacrylic acid or ester, or a copolymer of these acids or esters with other vinyl unsaturated monomers;

IV. and thereafter applying over the said layer (1), (2), or 3 (4) one of the following:

A. a layer of cellulose acetate, cellulose acetate butyrate, polyvinylacetal, polyvinyl acetate or partially hydrolysed polyvinyl acetate which layer comprises a light-sensitive diazonium compound,

B. a layer of cellulose acetate, cellulose acetate butyrate, polyvinylacetal, polyvinyl acetate or partially hydrolysed polyvinyl acetate followed by impregnation of the said layer with a light-sensitive diazonium compound, or

C. a layer of cellulose acetate or cellulose acetate butyrate, followed by surface hydrolysis of said layer and impregnation of said hydrolysed surface with a light-sensitive diazonium compound.

4,014,702

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Masanaga Ohki; Hartuo Takei; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

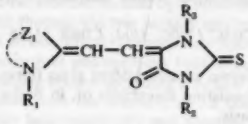
Continuation-in-part of Ser. No. 491,187, July 24, 1974, abandoned. This application July 21, 1975, Ser. No. 597,606

Claims priority, application Japan, July 24, 1973, 49-83339

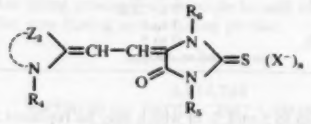
Int. Cl.² G03C *1/08*

U.S. Cl. 96—122 **11 Claims**

1. A silver halide photographic emulsion containing a spectrally sensitizing amount of a sensitizing dye represented by the general formula (I)


(I)

and a sensitizing dye represented by the formula (II)


(II)

wherein Z_1 and Z_2 each is an atomic group necessary to complete a benzoxazole ring or a naphthoxazole ring; R_1 is an alcohol group or an allyl group; R_2 is an allkyl group, or an allyl group; R_3 is an unsubstituted lower alkyl group, a hydroxyalkyl group or a carboxyalkyl group; R_4 is same as R_1; R_5 is an alkyl group, an allyl group or a phenyl group; R_6 is an alkoxycarbonylalkyl group, an hydroxyalkoxyalkyl group, an acyloxyalkoxyalkyl group, an N-(N,N-dialkylaminoaklyl) carbamoylalkyl group, an N-(N,N,N-trialkylammonium) carbamoylalkyl group or an N,N,N-trialkylammoniumalkyl group; X^- is an acid anion, an *n* is 0 or 1.

4,014,703

ONE PACKAGE COATING COMPOSITION

Hossein Hayati, and Russell S. Towers, both of Adrian, Mich., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Apr. 4, 1975, Ser. No. 565,301

Int. Cl.² C09D *5/10*

U.S. Cl. 106—1 **12 Claims**

1. A vehicle for a single package coating composition consisting essentially of a hydrolyzed alkyl polysilicate having a hydrolysis level of from 50 to 65 percent, an organic solvent and from 3 to 5.5 percent by weight of zinc chloride based on the total weight of the hydrolysate, said hydrolysate is obtained by hydrolyzing the alkyl polysilicate containing about 40 percent SiO_2 in the presence of an organic solvent, and

water in an amount of from about 0.08 to about 0.21 mole per mole of alkoxy present on the alkyl polysilicate at a pH of from 1.0 to 6.5.

4,014,704

INSULATING REFRACTORY FIBER COMPOSITION AND ARTICLES FOR USE IN CASTING FERROUS METALS

William Clyde Miller, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 512,786, Oct. 7, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,318

Int. Cl.² B28B 7/36

U.S. Cl. 106—38.22 13 Claims

1. In a refractory composition suitable for use for containment of molten ferrous metal in casting operations, which comprises, in percentage by weight, 30% to 50% refractory fiber, 5% to 45% inorganic binder, 2% to 10% organic binder, and 5% to 35% refractory filler, and wherein more than half of said refractory fiber component is alumino-silicate fiber, the improvement which comprises further incorporating into said composition 1% to 35% by weight granular silicon carbide.

4,014,705

GLASS COMPOSITIONS

Brian Yale, Ormskirk, England, assignor to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 302,462, Oct. 31, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,746

Claims priority, application United Kingdom, Nov. 3, 1971, 51177/71

Int. Cl.² C03C 13/00, 3/04; C04B 31/06

U.S. Cl. 106—50 5 Claims

1. Continuously-drawn alkali-resistant glass fibres having a glass composition consisting essentially of, in molar percentages on the oxide basis:

SiO_2	67 to 82
ZrO_2	7 to 10
R_2O	9 to 22.5
F_2	3 to 9
Al_2O_3	0 to 5
(computed as $AlO_{1.5}$)	

where R = Na, up to 5 mol.% of which may be replaced by Li or K, and the fluorine is included in substitution for oxygen in one or more of the oxides, the maximum value of the molar percentage represented by $SiO_2 + ZrO_2 + AlO_{1.5}$ being on a sliding scale dependent on the content of ZrO_2 ranging, when F_2 = 9 mol.%, from 89 mol.% when the ZrO_2 content is 7 mol.% to 88 mol.% when the ZrO_2 content is 8.5 mol.% down to 87 mol.% when the ZrO_2 content is 10 mol.% the said maximum value being reduced by a further 5 mol.% over the whole scale when F_2 = 3 mol.%, the glass having a fiberizing temperature not exceeding 1350° C and a liquidus temperature at least 40° C below the fiberizing temperature.

4,014,706

SOLID SOLUTION CERAMIC MATERIALS

Robert D. Waldron, Scottsdale, Ariz., assignor to Research Enterprises Corporation, Phoenix, Ariz.

Continuation of Ser. No. 252,659, May 12, 1972, abandoned. This application Apr. 21, 1975, Ser. No. 569,834

Int. Cl.² C04B 35/00, 35/48, 35/50

U.S. Cl. 106—55 19 Claims

1. A composition of matter consisting essentially of a solid solution of

a. a plurality of compounds, each containing one or more metallic elements, at least one of which elements is polyvalent, in combination with one or more elements selected from the group consisting of oxygen and fluorine,

b. at least 0.1 mole percent compounds selected from the group consisting of alkaline earth halides, yttrium earth halides and complex halides, as a binder aid; said solid solution containing oxygen and fluorine in an atomic ratio of about 0.5:1 to about 5:1.

4,014,707

CERAMIC DIELECTRIC COMPOSITION

Hitoshi Tanaka; Hitoshi Masumura, and Shinobu Fujiwara, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,017

Claims priority, application Japan, July 11, 1974, 49-79397

Int. Cl.² C04B 35/46; H01B 1/06

U.S. Cl. 106—73.31 10 Claims

1. A dielectric ceramic composition which comprises as principle constituents, 86–99.6 mole % of barium titanate, 0.2 – 10 mole% of niobium pentaoxide and 0.2 – 4 mole% of cerium oxide.

4,014,708

LIQUID STOVING-LACQUER SYSTEMS BASED ON OIL-FREE POLYESTERS

Bernd-Ulrich Kaiser; Rolf Dhein; Rolf Kuchenmeister, and Hans-Michael Fischler, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 528,088, Nov. 29, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,777

Claims priority, application Germany, Dec. 6, 1973, 2360710

Int. Cl.² C07C 69/34; C08K 5/10

U.S. Cl. 106—287 R 5 Claims

1. Liquid stoving-lacquer systems based on oil-free polyesters of polybasic carboxylic acids, and/or their anhydrides and polyhydric alcohols which polyesters have an acid number of from 1 to 40 and a hydroxyl number of from 50 to 400, characterized in that the alcohol starting components of said polyesters consist of

A. 30 – 100 mol-%, based on the sum of components A and B, of 2-ethylpropane diol-1.3,

B. 70 – 0 mol-%, based on the sum of components A and B, of alcohols having from 2 to 6, preferably from 3 to 4, hydroxyl groups and optionally

C. 0 – 30, preferably 0 – 20, mol-%, based on component A, of other diols.

4,014,709

OPACIFYING PIGMENTS AND METHODS FOR MAKING SAME

Franz R. Dykstra, Haverford, Pa.; Aldo P. Allegrini, Westfield, N.J.; Miller B. Mallary, Macon, Ga., and Tom A. Cecil, Highland Park, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Filed June 8, 1976, Ser. No. 693,751

Int. Cl.² C09C 1/36, 1/28

U.S. Cl. 106—300 8 Claims

1. A pigment having a color ranging from tan to light dun and useful in the manufacture of paints and plastics as an opacifier, said pigment comprising a mixture composed predominantly of a major weight proportion of particles of iron-bearing titania impurity originally contained in sedimentary clay and a minor weight proportion of particles of thermally dehydrated kaolin clay.

4,014,710
MAGNETIC PIGMENTS WITH IMPROVED ORIENTABILITY AND A PROCESS FOR THEIR PRODUCTION

Peter Woditsch, Krefeld; Franz Hund; Gunter Buxbaum, both of Krefeld-Bockum; Volker Hahnkamm, Krefeld, and Ingo Pflugmacher, Meerbusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1974, Ser. No. 489,665

Claims priority, application Germany, Aug. 2, 1973, 2339142

Int. Cl.² C09C *1/24*

U.S. Cl. 106—304 **10 Claims**

1. In the production of an acicular, magnetic iron oxide pigment by forming acicular iron oxide hydroxide seeds, growing said seeds, dehydrating, reducing and reoxidizing, the improvement which comprises contacting said precursor pigment as α-FeOOH, β-FeOOH or γ-FeOOH before hydration either in dry form or in suspension with about 0.05 to 5% its weight of an organo silicon compound.

4,014,711
SEPARATION OF FRUCTOSE FROM A MIXTURE OF SUGARS

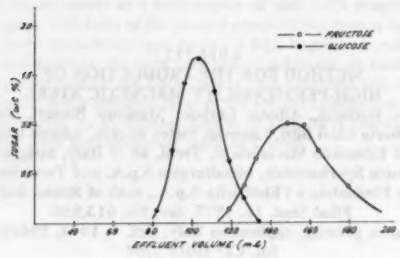
Hiroyuki Odawara; Yoshio Noguchi, and Masaji Ohno, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 18, 1976, Ser. No. 658,910

Claims priority, application Japan, Feb. 21, 1975, 50-20892

Int. Cl.² C13D *3/12;* **C13K** *3/00, 11/00*

U.S. Cl. 127—46 B **9 Claims**



1. A method for separation of fructose from a mixture of sugars essentially containing fructose and glucose, which method comprises contacting an aqueous solution of said mixture of sugars with crystalline alumino-silicate having an average pore diameter greater than about 5 A, desorbing the adsorbed sugars with water and separating the fructose-rich fraction obtained.

4,014,712
CATHODE-DEPOLARIZER MIX CONTAINING A POLYACRYLAMIDE BINDER

Richard J. Bryndal, Russell Township, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,819

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² H01M *6/00, 10/00*

U.S. Cl. 429—57 **11 Claims**

1. A galvanic cell having an anode; a cathode-depolarizer mix containing manganese dioxide, a carbonaceous conductive material and an electrolyte; and a separator interposed between said anode and said cathode-depolarizer mix and also containing a portion of the electrolyte; the improvement comprising discrete particles of polyacrylamide in said cathod-depolarizer mix in an amount ranging between about 0.1% to about 1.5% based on the weight of the cathode-depolarizer mix.

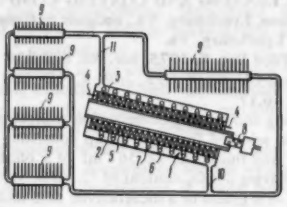
4,014,713
THERMOELECTRIC GENERATOR

Mikhail Abramovich Markman, ulitsa Shirokaya, 1, korpus 2, kv. 264; Leonid Mikhailovich Simanovsky, ulitsa 3 Mytischinskaya, 14, kv. 18; Nikolai Vasilievich Kolomoets, Kastanaevskaya ulitsa, 61, korpus 1, kv. 22, all of Moscow; Vyacheslav Tikhonovich Kamensky, Sovetsky prospekt, 26, kv. 112, Ivanteevka Moskovskoi oblasti; Igor Mikhailovich Matskov, ulitsa Festivalnaya, 22, korpus 3, kv. 263, Moscow; Valentin Prokofievich Protsenko, ulitsa Arbat, 30, kv. 72, Moscow; Boleslav Viktorovich Sporyshev, Festivalnaya ulitsa, 53, korpus 6, kv. 617, Moscow, and Valentina Sergeevna Baby, ulitsa Junykh Lenintsev, 75, korpus 3, kv. 28, Moscow, all of U.S.S.R.

Filed Aug. 15, 1975, Ser. No. 605,203

Int. Cl.² H01V *1/30*

U.S. Cl. 136—210 **4 Claims**



1. A thermo-electric generator comprising: a tubular thermo-electric module formed by a tubular inner heat conductor, a tubular thermo-electric battery enclosing said heat conductor, and an outer heat conductor enclosing said battery; means for burning fuel and applying heat to said inner heat conductor; a cooling system including a hollow radiator in heat-transfer contact with the ambient air, a cooling jacket enclosing said outer heat conductor and forming therewith an annular channel for the flow of a cooling liquid, and inlet and outlet pipes to connect said jacket with said radiator: said cooling system being filled completely with the cooling liquid; said jacket being arranged at an angle to said inlet pipe; and said outlet pipe having an ascending portion.

4,014,714
METHOD OF PRODUCING A MONOLITHIC SEMICONDUCTOR DEVICE

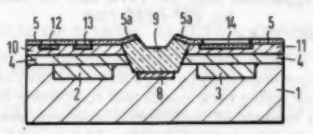
Helmuth Murrmann, Ottobrunn, and Ulrich Schwabe, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 1, 1975, Ser. No. 601,222

Claims priority, application Germany, Aug. 8, 1974, 2438256

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **9 Claims**



1. A method of fabricating a monolithic silicon semiconductor device having a surface zone exhibiting a first conductivity from a silicon crystal doped differently from said surface zone, the steps comprising:

applying a silicon nitride layer consisting of at least two separate areas onto a free face of said surface zone for use as an etching mask;

etching a groove-like cavity between said silicon nitride layer areas;

guiding a dopant ion beam substantially perpendicularly to

a centralized base area of said cavity while using said silicon nitride layer areas as an implantation mask so that only such cavity base area becomes doped;

oxidizing the resultant doped cavity base area while using said silicon nitride layer areas as an oxidation mask so that a silicon dioxide layer forms only in said groove-like cavity and completely separates said surface zone into at least two separate sections; and

treating said separate surface zone sections with a second dopant ion beam having sufficient energy to penetrate said silicon nitride layer areas and implant dopant within said separate surface zone sections so as to fabricate an element of a semiconductor device in each of said separate surface zone sections.

4,014,715

SOLDER CLEANING AND COATING COMPOSITION

John M. Preston, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Dec. 8, 1975, Ser. No. 638,829
Int. Cl.² C23F *7/12, 7/08;* **C11D** *7/08*
U.S. Cl. 148—6.17 **4 Claims**

1. A cleaning and coating composition comprising 200–500 ml. of an acid selected from the group consisting of sulfuric, hydrochloric and fluoboric, 38–567 ml. of a phosphoric acid concentrate having a P_2O_5 content of 72–80%, 55–76 grams of thiourea, 0.1–1.0 grams of a dicarboxylic acid and 3.8–7.5 ml of a wetting agent, together with enough water to make one gallon of the composition.

4. A process of removing oxidation and foreign contaminants from a solder plated printed circuit and the deposition of a phosphate film on the solder surface which comprises:

a. preparing a cleaning and coating bath from a solution containing an acid selected from the group consisting of 200–500 ml. of sulfuric acid, 200–400 ml. of fluoboric acid and 200–375 ml. of hydrochloric acid, 38–567 ml. of a phosphoric acid concentrate prepared by reacting 2–5% of a monosaccharide or polysaccharide and 54% of phosphoric acid heated at 300° F to concentrate the mixture to 72–80% of P_2O_5, 0.1–1.0 grams of a dicarboxylic acid, 3.8–7.5 ml. of a wetting agent, 55–76% of thiourea and sufficient water to make one gallon of the composition;

b. agitating the composition at room temperature;

c. and applying the composition to a solder surface to remove the contaminants and produce a phosphate coating on the solder surface.

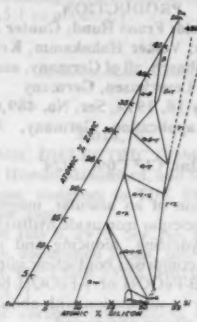
4,014,716

WROUGHT BRASS ALLOY HAVING A LOW SPRING BACK COEFFICIENT AND SHAPE MEMORY EFFECT

Amado Cabo, and Horace Pops, both of Pittsburgh, Pa., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 107,118, Jan. 18, 1971, abandoned. This application Sept. 20, 1974, Ser. No. 508,098
Int. Cl.² C22F *1/08*
U.S. Cl. 148—11.5 C **6 Claims**

1. An improved method of manufacture for a wrought, polycrystalline brass alloy having a shape memory characteristic and a low spring back coefficient comprising the steps of providing a mixture of constituents consisting essentially of about 0.56 to 6.6, atomic % silicon, 23.5 to 40.5, atomic % zinc and the balance copper, combining said constituents in a substantially homogeneous alloy composition to provide an alloy having a stable beta phase above 454° C. and having a Martensite transformation temperature defined approximately by the formula $M_s(°\ K) = +3280 - 80Zn - 120Si$ where $M_s(°\ K)$ is the Martensite transformation temperature in ° K, Zn is atomic percent zinc, and Si is atomic percent silicon, and where the Martensite transformation temperature is substantially at or below the temperature of normal use of said alloy, fabrication of said alloy by working said alloy to insure a polycrystalline structure, heating to effect betatizing wherein essentially all of said alloy is in the beta phase and subsequently quenching said alloy to a temperature at or below the



temperature of normal use of said alloy to retain beta phase in said alloy.

4,014,717

METHOD FOR THE PRODUCTION OF HIGH-PERMEABILITY MAGNETIC STEEL

Mario Barisoni, Albano Laziale; Massimo Barteri, Rome; Roberto Ricci Bitti, Lanuvio; Pietro Brozzo, Albano Laziale, and Edmondo Marianeschi, Terni, all of Italy, assignors to Centro Sperimentale, Metallurgico S.p.A. and Terni Societa per l'Industria e l'Elettricita S.p.A., both of Rome, Italy

Filed Sept. 16, 1975, Ser. No. 613,956
Claims priority, application Italy, Oct. 9, 1974, 53432/74
Int. Cl.² H01F *1/04*
U.S. Cl. 148—111 **3 Claims**

1. A method for the production of oriented-grain high magnetic permeability steel sheet, comprising the steps of continuously casting a steel slab having a weight % composition within the range of 2.5–3.5 Si, 0.01–0.04 S, less than 0.07 C, less than 0.15 Mn, and an acid-soluble aluminum in an amount between 0.01 and 0.05, at a feed rate ranging from 700 to 1000 kg/minute, into an ingot mold of a length over 1200 mm and cooling it in said ingot mold with a quantity of water ranging from 2.8 to 4 m^3 per ton of steel, wherein said cooling is undertaken at a rate such that the slope of the cooling curve attains the minimum possible value; heating the slab so obtained to 1300°–1400° C and immediately thereafter hot-rolling it to a thickness in the range between 2 and 3.1 mm, annealing the strip so obtained at a temperature in the range between 1050° and 1150° C, keeping it at said temperature for a duration between 5 and 30 seconds; cooling it to 750°–850° C at a temperature at which austenite is still present in it, and keeping the strip at this temperature for a deviation ranging from 30 to 200 seconds; and finally quenching it from the initial quenching at a mean cooling rate from the starting to 400° C at a cooling rate ranging between 10° C/second and 100° C/second thereby resulting in an optimum austenite content and thus an optimum amount of high hardness microstructural component which is, in a volume ratio from between 1 to 20%; cold-rolling the strip so obtained with a reduction ate ranging from 80 to 90% and subjecting it finally to decarburization and recrystallization annealing operations.

4,014,718

METHOD OF MAKING INTEGRATED CIRCUITS FREE FROM THE FORMATION OF A PARASITIC PNPN THYRISTOR

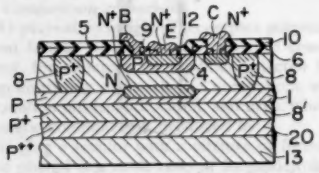
Akihiro Tomozawa, Hinode; Takanori Nishimura, Kokubunji, and Takashi Yamaguchi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 2, 1975, Ser. No. 609,604

Claims priority, application Japan, Sept. 4, 1974, 49-100905

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 1 Claim



1. In an integrated circuit having at least one or more NPN transistors using a semiconductor substrate of one conductivity type, a method of making integrated circuits free from the formation of a parasitic PNPN thyristor characterized in that a layer of the second conductivity type is formed on said substrate, an isolation region of the first conductivity type is formed in said layer, a layer of the first conductivity type having a high impurity concentration is formed on the back face of said substrate, a diffusion layer of the first conductivity type which serves as a base region of said NPN transistor is formed in said layer of the second conductivity type, a layer of the first conductivity type having a high impurity concentration is formed on the back face of said substrate, an insulation layer is formed on the back face of said substrate and on the substrate, snd a diffusion layer of the second conductivity type which serves as an emitter region of said NPN transistor is formed with said insulation layer as a mask.

4,014,719

FLEXIBLE EXPLOSIVE COMPOSITION COMPRISING PARTICULATE RDX, HMX OR PETN AND A NITROSTARCH BINDER PLASTICIZED WITH TEGDN OR TMETN

Franklin B. Wells, Memphis, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1975, Ser. No. 625,211

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.7 7 Claims

1. A flexible, self-supporting explosive composition of high power and brisance composed essentially entirely of explosive ingredients and consisting essentially of:

a. from 60 to 80 weight percent of a particulate high explosive selected from the group consisting of cyclotrimethylenetrinitramine, cyclotetramethylenetetranitramine and pentaerythritol tetranitrate and mixtures thereof having an average particle size not exceeding about 25 microns; and

b. from 20 to 40 weight percent of a binder system consisting essentially of nitrostarch of from 12.6 to 13.3 percent nitrogen content and a plasticizer therefor selected from the group consisting of trimethylolethane trinitrate and triethyleneglycol dinitrate and mixtures thereof, wherein the weight ratio of the nitrostarch to the plasticizer is about from 0.7/1 to 1.4/1, respectively.

4,014,720

FLEXIBLE EXPLOSIVE COMPOSITION COMPRISING PARTICULATE RDX, HMX, OR PETN AND A HIGH VISCOSITY INTROCELLULOSE BINDER PLASTICIZED WITH TEGDN

Franklin B. Wells, Memphis, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 625,978

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.8 3 Claims

1. A flexible, self-supporting explosive composition of high power and brisance composed essentially entirely of explosive ingredients and consisting essentially of

a. about from 50 to 90 weight percent of a particulate high explosive selected from the group consisting of cyclotrimethylenetrinitramine, cyclotetramethylenetetranitramine and pentaerythritol tetranitrate and mixtures thereof having an average particle size not exceeding about 25 microns; and

b. about from 10 to 50 weight percent of a binder system consisting essentially of high viscosity nitrocellulose containing about from 12.1 to 12.5 percent nitrogen, and triethyleneglycol dinitrate plasticizer;

wherein the amount of said nitrocellulose is about from 1 to 8 weight percent of the composition and the weight ratio of said plasticizer to said nitrocellulose is about from 4:1 to 7:1, respectively.

4,014,721

IGNITION MIXTURE FOR INITIATING UNDERGROUND IN-SITU COMBUSTION

Günter Pusch, Celle, and Rudolf Gedenk, Ovelgonne, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation of Ser. No. 427,158, Dec. 21, 1973, abandoned. This application July 11, 1975, Ser. No. 595,266

Claims priority, application Germany, Dec. 29, 1972, 2263960

Int. Cl.² C06B *25/02*; C10L *1/18*; C10J *5/00*; E21B *43/24*

U.S. Cl. 149—108.6 8 Claims

1. An ignition mixture for initiating insitu combustion in an underground formation, said mixture based on an unsaturated organic compound and ignited by a free oxygen-containing gas, containing:

a. from about 2 to about 30 parts by weight of the total weight of said mixture of olefinic hydrocarbons or unsaturated fatty acids,

b. from about 0.1 to about 15 parts by weight of an organic peroxide,

c. from about 0.001 to about 0.1 parts by weight of a heavy metal salt.

4,014,722

METHOD OF MAKING ELECTRIC CONDUCTOR

Lawrence R. Deardurff, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 322,311, Jan. 10, 1973, Pat. No. 3,818,412. This application June 17, 1974, Ser. No. 480,438

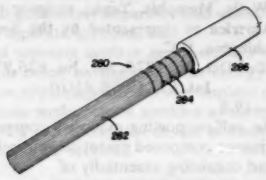
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.² H01B *1/04, 5/16*

U.S. Cl. 156—52 4 Claims

1. In a method of making an electrically conductive roving, including uniformly spirally wrapping in spaced relation a non-conductive binding element around a bundle of electrically conductive filaments forming a cylindrical bundle of conductive filaments having windings of binding element thereon and forming a uniform semi-conductive overcoat around said roving in good electrical contact with said bundle of conductive filaments, the improvement comprising the

steps of impregnating the spaces between the windings of said binding element and said conductive filaments by dipping said roving in a liquid polymeric dispersion of conductive particles, partially curing the polymer coating by heating the roving,



cooling the partially cured polymeric coating, overcoating the partially cured polymeric coating with an overcoat integral with said coating by dipping said roving in said liquid polymeric dispersion and fully curing said coating and integral overcoat by heating said roving.

4,014,723

COMPOSITE CONTAINERS

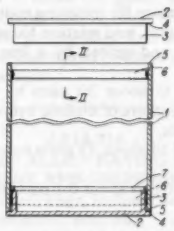
Ulpian Robin Edward Frost Jones, St. Albans, England, assignor to The Metal Box Company Limited, Reading, England

Filed Mar. 30, 1972, Ser. No. 239,564

Claims priority, application United Kingdom, Apr. 14, 1971, 9377/71

Int. Cl.² B29C *27/00*

U.S. Cl. 156—69 **3 Claims**



1. The method of making a container of the type including an open ended tubular body and a closure member having a plug portion receivable in one end of said body, said method including the steps of applying a thick continuous band of softened thermoplastics material to the interior of the body at a position spaced from an adjacent end face of the body, smearing the thermoplastics material along the interior of the body by pressing the plug portion of the closure member axially of the body into closing relation with the body and with concomitant formation at the inner end of the plug portion of a bead of the thermoplastics material to caulk the leak path between the body and the plug portion to the rim adjacent to the end face of the body, and cooling the thermoplastics material to create a bond between the plug portion and the body, the thermoplastics material being applied to the body in a molten state immediately prior to the application of the end closure member to the body with the thermoplastics material being applied in the form of a jet during relative rotation between the jet and body.

4,014,724

BOTTLE-SHAPED CONTAINERS OF THE ONE-WAY TYPE AND A METHOD FOR THE MANUFACTURE OF THE SAME

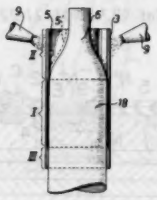
Ruben A. Rausing, Via Kenia 22-24, Rome, Italy

Filed Dec. 15, 1975, Ser. No. 640,861

Claims priority, application Switzerland, Jan. 3, 1975, 2/75

Int. Cl.² B29C *27/29*

U.S. Cl. 156—86 **4 Claims**



1. A method for making a container from a blank of a laminate material, said laminate having two layers of a heat-shrinkable foamed plastic material and an intermediate layer disposed between the layers of foamed plastic material intermediate the longitudinal ends of the blank to form two end zones and an intermediate continguous transverse zone, said intermediate layer comprising a material selected from the group consisting of a homogeneous plastic material, metalfoil, glass film, and paper said method comprising bending the blank around a first cylindrical mandrel, the axis of which extends transversely of the blank, with the longitudinal ends of the blank overlapping, heat sealing the overlapping longitudinal ends of the blank to form a tube-like element, removing said tube-like element from the first mandrel, placing the tube-like element on a second mandrel having a cylindrical portion for receiving the intermediate transverse zone of the tube-like element and a portion of reduced cross-sectional area at one end thereof adjacent one end zone of the tube-like element, heating the last mentioned end zone of the tube-like element to shrink the end zone to conform with the portion of the second mandrel having a reduced cross-sectional area to form a bottle necked top opening of the container and closing the opposed end zone of the tube-like element to form a liquid tight bottom seal for the container.

4,014,725

METHOD OF MAKING CARBON CLOTH FROM PITCH BASED FIBER

David Arthur Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,777

Int. Cl.² D03D *25/00*; D01F *9/12*; B32B *3/06*

U.S. Cl. 156—148 **8 Claims**

1. A process for producing carbon cloth which comprises spinning a carbonaceous fiber from a nonthixotropic carbonaceous pitch having a mesophase content of from 40 percent by weight to 90 percent by weight which under quiescent conditions forms a homogeneous bulk mesophase having large coalesced domains; heating the spun fiber in an oxygen-containing atmosphere at a temperature of from 250° to 500° C. for a time sufficient to oxidize the fiber to an oxygen content of from 17 percent by weight to 30 percent by weight; processing the oxidized fiber into a cloth by a process selected from this group consisting of knitting and weaving; and carbonizing the cloth produced in this manner by heating in an inert atmosphere.

4,014,726

PRODUCTION OF GLASS FIBER PRODUCTS

Harland E. Fargo, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 18, 1974, Ser. No. 452,293

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B32B *17/04, 27/42*

U.S. Cl. 156—167 6 Claims

1. A method of preparing a bonded glass fiber product comprising the steps of:

a. forming glass fibers from molten streams of glass;

b. combining the glass fibers with a heat curable aqueous binder composition comprising

1. 60–95 percent by weight of a complex polymeric component formed from a reaction mixture consisting of phenol, formaldehyde, a modifier selected from the group consisting of starch and compounds which are degradation products of starch, and urea, wherein said polymeric component is produced by:

a. charging a reactor with a mixture of formaldehyde and phenol in a mole ratio of formaldehyde/phenol of from 2.9–4.2/1;

b. reacting the mixture in the presence of a condensing agent until it has a free formaldehyde content of from 7–15 percent of the total weight of formaldehyde, phenol and water;

c. adding to the reactor the starch or starch decomposition product in an amount ranging from 5 to 50 percent of the phenol charged; and

d. cooling the reactor contents;

2. 10–80 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component, with the proviso that at least 5 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component is dissolved in the polymeric component for at least fifteen minutes at a temperature of at least 90°F.

3. 0.5–25 percent of a lubricant based upon the total weight of the complex polymeric component and any unreacted urea,

4. 0.1–1 percent of a silane, based on the total weight of the complex polymeric component and any unreacted urea,

5. 0.2–3.0 percent of an ammonium salt of a strong acid based on the total weight of the complex polymeric component and any unreacted urea,

6. water, to dilute the binder to a desired solids content of from 1–40 percent,

c. consolidating the fibers and heat curable aqueous binder composition into a loosely packed mass on a foraminous conveyor; and

d. curing the heat curable binder composition in situ on the glass fiber product.

4,014,727

CORRUGATING ADHESIVE COMPOSITION

Camillus B. Musselman, Chesterfield, and Edward M. Bovier, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Division of Ser. No. 477,326, June 7, 1974, Pat. No. 3,912,531, and a continuation-in-part of Ser. No. 264,868, June 21, 1972, abandoned, and a continuation-in-part of Ser. No. 368,109, June 8, 1973, abandoned. This application July 18, 1975, Ser. No. 597,396

Int. Cl.² B31F *1/22*

U.S. Cl. 156—205 7 Claims

1. A method of making multiwall thickness corrugated board at high speeds comprising the steps of

a. preparing an adhesive mix having modified waxy starch in the carrier portion, said starch having a fluidity of about 25 to about 90 mls,

b. applying said mix to a corrugator, and

c. forming a multiwall board on said corrugator at a higher than normal rate of speed.

4,014,728

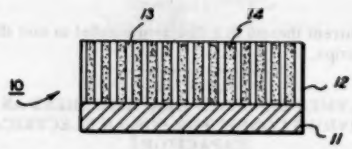
METHOD OF MAKING AN IMAGING MEMBER

Peter F. Erhardt, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 527,664, Nov. 27, 1974, Pat. No. 3,979,495. This application Mar. 29, 1976, Ser. No. 671,239

Int. Cl.² B29D *7/18*

U.S. Cl. 156—244 1 Claim



1. A method of forming an imaging member comprising a photoconductive layer having plural photoconductive paths oriented substantially perpendicular to a surface of said layer and a conductive substrate, said method consisting essentially of:

a. preparing a photoconductive block copolymer by anionic copolymerization of a polynuclear condensd aromatic vinyl compound selected from the group consisting of 3-vinylpyrene, 2-vinylanthracene, 2-propenyl-2-anthracene and 2 vinyl-N-alkyl carbazoles with a monomer selected from the group consisting of 1,3-butadiene, 1,3-pentadiene (piperyline), 2-methyl-1,3-butadiene (isoprene) 2,3-dimethyl-1,3-butadiene and cyclic octamethyl tetrasiloxane;

b. extruding and cooling a melt of said copolymer to form an extrusion having lamellae of at least two phases, one phase being photoconductive and the other phase being elastomeric, said lamellae being disposed in a direction lying substantially parallel to the direction of extrusion, and cutting said extrusion transerversely to form said layer; and

c. placing said layer upon a conductive substrate, with said lamellae being disposed in a direction substantially normal to the horizontal plane of said substrate to form an imaging member.

4,014,729

METHOD FOR BONDING AND PLATING WITH EXPLODING FOIL

Gay Leon Dybwad, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 362,191, May 21, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,775

Int. Cl.² B23K *11/26;* C03C *27/08;* C23C *13/08*

U.S. Cl. 156—275 10 Claims

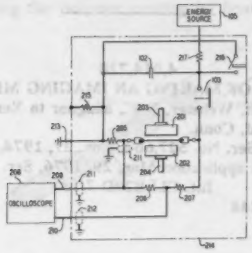
1. A method of bonding a pair of workpieces comprising the steps of

cutting at least one slit in a metal foil slab along a surface thereof to form at least two strips of said foil separated by said slit,

pressing said foil between said workpieces in an area to be bonded, and

exploding said foil by the rapid application of a high inten-

whereby said strips are drawn together by said current during said explosion.



sity current thereto in a direction parallel to said slit and said strips,

4,014,730

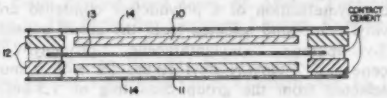
POLYMER DENSIFIED GRAPHITE SHEET AS IMPERVIOUS CONNECTOR FOR AN ELECTRICAL CAPACITOR

Theodore B. Selover, Jr., Shaker Heights; Donald L. Boos, Garfield Heights, and Thomas H. Hacha, Willoughby, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 385,435, Aug. 3, 1973, which is a continuation-in-part of Ser. No. 251,225, May 8, 1972, abandoned. This application July 31, 1974, Ser. No. 493,278

Int. Cl.² B05D *7/24*

U.S. Cl. 156—331 **5 Claims**



1. A process for preparing an electron-conducting, ion-insulating connector for use in an electrical capacitor comprising the following steps in sequence:

a. coating a single surface of a thin, flexible, porous, sheet of graphite having a thickness within the range of about 0.3 to 10 mils with a viscous paste of an elastomer containing a vulcanizing agent, said elastomer being a member selected from the group consisting of butyl rubber, copolymers of butadiene-urethane and vinylidene fluoride-hexafluoropropylene;

b. covering the elastomer-coated surface on the graphite with a second sheet of the graphite, forming a composite;

c. compressing the composite formed in (b) under sufficient pressure to impregnate the two sheets of graphite with elastomer and to exude any excess elastomer from therebetween so as to form a laminate of essentially the two sheets of elastomer-impregnated graphite; and

d. vulcanizing the elastomer-impregnated laminate obtained in (c) at a temperature of from about 25° to 220° C and a at a pessure of from about 15 to 15,000 psi.

4,014,731

APPARATUS FOR BINDING ARTICLES WITH TAPE

Iwao Muto, Minami-ashigaramachi, Japan, assignor to Toshiba Seiki Kabushiki Kaisha, Japan

Filed Mar. 9, 1976, Ser. No. 665,311

Claims priority, application Japan, July 3, 1975, 50-81406

Int. Cl.² G05G *15/00;* **B65B** *13/30*

U.S. Cl. 156—350 **12 Claims**

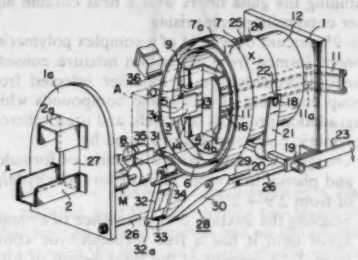
1. Apparatus for binding articles with tape comprising:

an article receiving structure for guiding an article into and positioning the same in binding position;

tape roller mean for feeding a specific length of a free end portion of a tape from a tape supply and subsequently drawing back the tape;

a tape guide for guiding said free end portion of the tape into a voluted and looped state of a number of turns around a part of the article thus positioned and movable in a manner to separate from and leave the tape in said state;

clamping means comprising an actuating mechanism and a pair of clamping members for clamping and holding the article in the binding position from opposite sides thereof, one clamping member having an extension for holding the leading extremity of the tape free end portion against the article, the tape in said state thereupon being drawn



back by the tape roller means and thereby being bound tight around the article;

cutting means for cutting off the tape free end portion thus bound, thereby forming a trailing extremity thereof;

securing means for securing the tape trailing extremity to the tape portion thus bound; and

control and actuating means operating upon reception of the article by the article receiving structure to operate in appropriate sequence the tape roller means, the tape guide, the clamping means, the cutting means, and the securing means.

4,014,732

DEVICE FOR DRYING AND SETTING THE ADHESIVE ON BACKS OF BOOKS

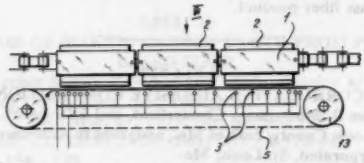
Alexander Beckert, Vienna, Austria, and Karl-Heinz Knobbe, Ellerbeck, Germany, assignors to Firma Mohndruck, Reinhard Mohn oHG, Gutersloh, Germany

Filed May 29, 1975, Ser. No. 581,616

Claims priority, application Germany, June 1, 1974, 2426704; Nov. 29, 1975, 2553816

Int. Cl.² B29C *19/02*

U.S. Cl. 156—380 **9 Claims**



1. A device for drying and setting of adhesive on backs of book blocks, in particular of backing adhesive material applied to backs of books, comprising:

a book binding machine including adjacent thereto a feeding means including a conveyor belt on which said backs of said books are disposed and a gripper means for holding said books in a feeding and clamping range;

a plurality of HF-electrodes positioned opposite to said backs of the book blocks and laterally with respect to a longitudinal axis relative to and under said conveyor belt, said electrodes being mounted in said feeding and clamp-

ing range for said gripper means of said feeding means adjacent to said book binding machine, said HF-electrodes being spaced apart at different distances with respect to each other, the distance of the electrodes with respect to each other is substantially close together at a starting range of said conveyor belt, said HF-electrodes being spaced farther apart at a center range of said conveyor belt, and said HF-electrodes being spaced close with respect to each other in a spacing which substantially corresponds to their distance spacing at said starting range of said conveyor belt at an end of the conveyor belt; and

an exhaust means for removing evaporation leaving said backing adhesive material.

4,014,733

APPARATUS FOR PRODUCING MULTIPLE PANE WINDOWS

Jacques Charles Loubet, Montmorency, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

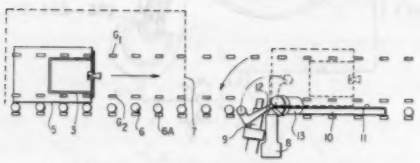
Continuation of Ser. No. 335,016, Feb. 23, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,368

Claims priority, application France, Mar. 2, 1972, 72.07230

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² B32B *31/12*

U.S. Cl. 156—446 **5 Claims**



1. Apparatus for the manufacture of multiple pane windows of polygonal shape, said apparatus comprising means defining a rectilinear path of travel for a pair of edges of a pair of transparent sheets supported parallel to, in fixed position, and substantially in register with respect to each other, means disposed adjacent an upstream portion of said path to heat said edges upon passage thereof along said portion, a nozzle having an orifice disposed downstream of said heating means to inject a sealant between said edges, cooling means disposed along said path downstream of said heating means and nozzle to abstract heat from said sealant, crank means pivoted about a fixed axis transverse of said path and substantially intersecting the orifice of said nozzle, and means on said crank means to grip said sheets upon arrival of the trailing end of said edges substantially at said axis, whereby said sheets may be rotated by said crank means in the plane thereof about said axis with said axis substantially intersecting the trailing end of said edges to present another pair of the edges of said sheets to said path.

4,014,734

TUBE FORMING DEVICE

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

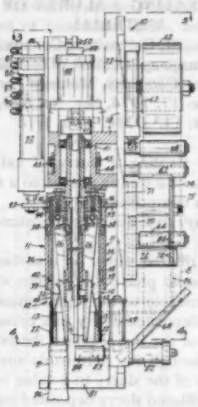
Continuation of Ser. No. 479,671, June 17, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,761

Int. Cl.² B31F *7/00*

U.S. Cl. 156—459 **10 Claims**

1. A device for forming a predetermined length of adhesive coated tape having opposite first and second ends into a tube, said device comprising:

a mandrel comprising a support member having an axis and a multiplicity of flexible resilient bristles, each of said bristles attached at one end to said support member and projecting radially outwardly therefrom and the outer tips of said bristles defining a peripheral surface around said axis in the shape and size of a said tube to be formed so that a said length of tape may be wrapped around the peripheral surface and its first and second ends overlapped to form a tape tube with a seam running axially from end to end; and



means mounted for movement axially along the support member and adapted to engage an end of a said tube formed around said peripheral surface and to move the tube axially off the mandrel, said means also deflecting said bristles and breaking the contact between the tips of the bristles and the pressure sensitive adhesive on the inner surface of the tube.

4,014,735

CONCENTRATION AND SEPARATION OF CORROSIVE LIQUID MIXTURES

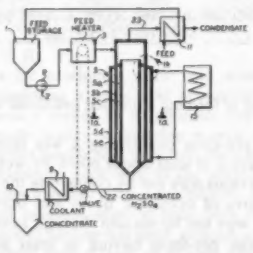
Hans Guth, Berg. Neukirchen; Hans-Joachim Kaiser; Klaus Kleine-Weischede, both of Leverkusen; Hermann Wieschen, Cologne, all of Germany, and Hans L. Kühnlein, Fullinsdorf, Switzerland, assignors to HCH. Bertrams Aktiengesellschaft, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 442,937, Feb. 15, 1974, Pat. No. 3,933,575. This application Aug. 15, 1975, Ser. No. 605,365

Claims priority, application Germany, Mar. 6, 1973, 2311085

Int. Cl.² B01D *1/22, 3/00, 1/00*

U.S. Cl. 159—13 A **4 Claims**



1. An apparatus for processing a corrosive liquid comprising first, second and third concentric upright tubes defining first, second and third concentric spaces, said first tube being made of heat resistant material inert relative to the corrosive liquid, means for passing said corrosive liquid in the form of a film over the wall of said first tube remote from said second space, a molten material in said second space, a further molten mate-

rial in said third space, external heating means for said further molten material, and means for recirculating said further molten material in said third space and to said external heating means.

4,014,736

PROCESS FOR TREATING A SLURRY OF CELLULOSIC MATERIAL

Ernest Arthur Sexton, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold and Canadian International Paper Company, Montreal, both of, Canada

Filed Dec. 17, 1974, Ser. No. 533,692

Int. Cl.[2] D21C *9/06, 9/18*

U.S. Cl. 162—38 **21 Claims**

1. A process for treating a slurry of cellulosic material including application of a treating liquid to a mat of the cellulosic material which comprises:

a. diluting the slurry to reduce its consistency to a flowable level;

b. depositing the diluted slurry on a surface permeable to the liquid and solid phase thereof but which is substantially more permeable to the liquid phase;

c. subjecting the deposited slurry to a pressure differential, whereby more of the liquid phase thereof than the solid phase passes through the permeable surface to increase the consistency of the slurry to a value between the consistency of the diluted slurry deposited on the surface and the consistency of the slurry prior to its dilution, thereby forming a mat of cellulosic material on said surface;

d. recycling substantially all of the liquid and solids which pass through the surface for use as the slurry diluent in step (a); and then

e. applying the treating liquid to the mat of cellulosic material on said surface.

4,014,737

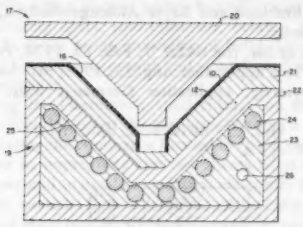
METHOD OF MOLDING PREFORM HAVING 600% BY WEIGHT WATER

Robert M. Brennan, R.R. 8, Columbia City, Ind. 45725

Filed May 19, 1975, Ser. No. 578,933

Int. Cl.[2] D21J *3/12*

U.S. Cl. 162—226 **15 Claims**



1. A method of forming a molded cellulosic article comprising

forming a pre-form comprising a wet layer of cellulosic fibers, having at least about 600% by weight water, on a water-pervious wire net by contacting the wire net with a water slurry of cellulosic fibers and drawing the fibers onto the wire net by suction through said wire net.

disposing the pre-form having at least about 600% by weight, while water on said wire net, onto a first die surface of a mold,

contacting the pre-form, having at least about 600% by weight water, with a second die surface of said mold, and

drying the pre-form having at least about 600% by weight water to less than about 5% by weight water in a heated press by pressing said wet layer of cellulosic fibers on said wire net in said heated press between said die surfaces at a pressure less than about 400 p.s.i., while allowing resulting steam to escape from said mold through said wire net and through said cellulosic fibers.

4,014,738

SIFTING DRUM PAPER MACHINE WHEREIN THE DILUENT WATER IS CONTROLLED

Klaus Prechtel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany

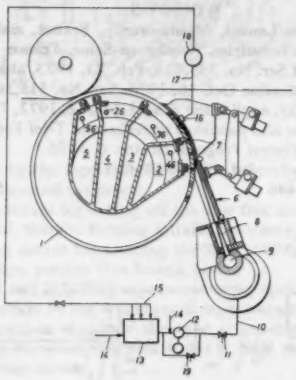
Filed Sept. 18, 1974, Ser. No. 507,166

Claims priority, application Germany, Sept. 20, 1973, 2347369

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.[2] D21F *1/06, 1/08*

U.S. Cl. 162—258 **2 Claims**



1. A sifting drum paper machine having a sifting drum with a pulp material inlet located at the outside thereof and suction chambers disposed in the interior thereof and with means for measuring pressure in vicinity of a paper web-forming part on the surface of the drum, said pressure measuring means operatively connected with means controlling the quantity of diluent water to the supply of pulp material to said pulp material inlet in accordance with said measured pressure.

4,014,739

MOLD CONSTRUCTION HAVING REMOVABLE BASE MEMBER

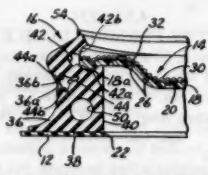
Frederick M. Granberg, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,421

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.[2] B41B *11/60;* **D21J** *7/00*

U.S. Cl. 162—274 **13 Claims**



1. A mold for use with a molded pulp product making apparatus and the like, said mold comprising, in combination, base member means having a deposit surface adapted to receive a layer of pulp thereon and having a peripheral marginal

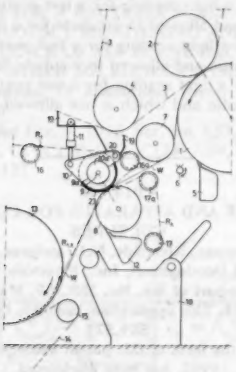
edge, support frame means including a unitary resilient body member defining wall means circumscribing said base member and having interior and exterior surfaces, first circumferential groove means formed in the interior surface of said wall means receiving at least a portion of said marginal edge of said base member means in supporting relation, second circumferential continuous groove means of a predetermined transverse cross-sectional configuration formed in said exterior surface of said wall means, and elongated retainer means releasably received within said second groove means and having a length substantially equal to the circumferential length of said second groove means, said body member being made of a material capable of selective manipulation when said retainer means is removed from said second groove means to allow said marginal edge of said base member to be inserted and removed from said first groove means, said body member and said retainer means cooperating to substantially prevent removal of said base member from said first groove means when said retainer means is disposed within said second groove means.

4,014,740

STRUCTURE FOR TRANSFERRING A WEB FROM THE PRESS SECTION TO THE DRYING SECTION OF A PAPER MACHINE

Martti Koponen, and Lassi Veijonen, both of Jyvaskyla, Finland, assignors to Valmet Oy, Helsinki, Finland

Filed Sept. 8, 1975, Ser. No. 611,423
Claims priority, application Finland, Sept. 12, 1974, 742670
Int. Cl.² D21F 7/00
U.S. Cl. 162—289 **11 Claims**



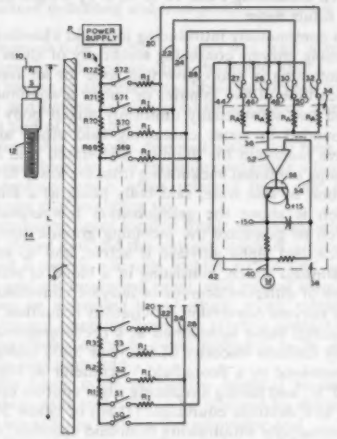
1. In a paper machine, a press section having a last press roll from which a web travels beyond the press section, a drying section having a first drying roll for receiving the web travelling beyond said last press roll from said press section, roll means situated between said last press roll and said first drying roll for guiding and supporting the web as it travels from said last press roll to said first drying roll, said roll means including a pair of rolls situated along the path travelled by the web from said last press roll to said first drying roll, weighting roll means cooperating with that one of said pair of rolls which is nearer to said first drying roll for defining with said one of said pair of rolls a nip through which the web travels least when a web initially travels from the press section to the drying section, and control means cooperating with said weighting roll means for controlling the pressure between the latter and said one of said pair of rolls at least during travel of an initial portion of the web from the press section to the drying section and for displacing said weighting roll means away from said one roll when the travel of the web from the press section to the drying section while supported and guided by said pair of rolls has become stabilized, said one of said pair of rolls and the nip defined between the latter and said weighting roll means being situated substantially midway between the other of said pair of rolls and said first drying roll.

4,014,741

NUCLEAR CONTROL ROD POSITION INDICATING ASSEMBLY

Milton Kearney Foxworthy; John Timothy Huston, and Burton Davis Ziels, all of Lancaster, Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed July 11, 1975, Ser. No. 594,999
Int. Cl.² G21C 7/00
U.S. Cl. 176—19 EC **9 Claims**



1. A position indicator circuit comprising:
a voltage divider circuit;
a series of reed switches connected to different points of said voltage divider circuit;
four output lines sequentially connected to every fourth one of said series of reed switches for receiving output signals from said voltage divider circuit through said series of reed switches; and
indicating means connected to said output lines for indicating the output of said divider circuit.

4,014,742

PRODUCTION OF CITRIC ACID IN SLACK WAX MEDIA

Robert C. Nubel, Wantagh, N.Y., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,347
Int. Cl.² C12D 1/04
U.S. Cl. 195—28 R **5 Claims**

1. A process for producing citric acid which comprises aerobically propagating a citric acid accumulating strain of yeast of the genus Candida in an aqueous nutrient medium containing enough readily assimilable source of carbon to promote growth but insufficient to permit the accumulation of citric acid; introducing slack wax as the principal source of assimilable carbon together with a solubilizing agent into the aqueous nutrient medium after at least 50% of the readily assimilable source of carbon has been utilized, continuing the aerobic propagation until a level of at least about 1 gram of citric acid has been accumulated per liter of aqueous medium and recovering citric acid, said solubilizing agent being selected from the group consisting of alkanols having 4 to 10 carbon atoms in each alkyl moiety, lower alkyl esters of alkanoic acids having 2 to 6 carbon atoms, alkenes and alkanes having 8 to 19 carbon atoms, turpentine, mineral oil and mixtures thereof.

4,014,743
METHOD FOR CONTINUOUS PREPARATION OF COOKED THINNED STARCH PASTES

William C. Black, Cedar Rapids, Iowa, assignor to Penick & Ford, Limited, Cedar Rapids, Iowa

Filed Jan. 10, 1973, Ser. No. 322,362
Int. Cl.² C12D *13/02*
U.S. Cl. 195—31 R 6 Claims

1. Method for continuous preparation of cooked thinned starch paste ready for application as a starch size or starch adhesive, comprising in combination the steps of:

a. continuously introducing a feed into a single chamber converting zone provided with agitation means, said feed consisting essentially of a water slurry of raw granule starch containing from 10 to 45% by weight starch on a dry solids basis;

b. also continuously introducing into said chamber a starch thinning enzyme consisting essentially of alpha amylase;

c. maintaining in said converting zone for an average residence time of five minutes or longer a continuously agitated and substantially uniformly mixed body of starch suspended in water containing said alpha amylase in active condition for thinning said starch said agitation causing continual backmixing from the lower to the upper portion of said zone, said body being at a temperature which is above the gelatinization temperature of the starch to gelatinize the incoming granule starch and at which said alpha amylase is active, and to subject the gelatinized starch, consisting of a blend of starch molecules of different degrees of enzyme conversion, to further enzyme conversion for viscosity reduction, said body of starch being maintained at a predetermined substantially uniform viscosity of not over 5000 centipoises, as determined by a Brookfield Viscometer at 100 rpm and 190° F., and having a reducing sugar content corresponding to a dextrose equivalent (D.E.) of below 3%;

d. continuously withdrawing from said chamber, in proportion to the volume of said feed, a stream of completely gelatinized thinned starch paste consisting of said blend of starch molecules of different degrees of enzyme conversion at substantially the same viscosity and D.E. as the body of starch maintained in said chamber; and

e. inactivating the alpha amylase enzyme in said withdrawn paste without substantial further enzyme conversion of said withdrawn paste.

4,014,744
PROCESSES FOR MEASURING TRI-, DI- AND MONOGLYCERIDES

Eppie Sheng Chang, Elkhart, Ind., assignor to Miles Laboratories Inc., Elkhart, Ind.

Filed Jan. 30, 1975, Ser. No. 545,703
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R 8 Claims

1. In a process for measuring glycerides in a fluid in which substantially all of the glycerides are saponified to glycerol with an ethanol-potassium hydroxide saponifying reagent, the improvement which consists of effecting saponification by incubating a combination of the fluid and the saponifying reagent at a temperature between 35 and 40° C. until said saponification is substantially complete.

4,014,745
APPLICATION OF LUCIFERASE ASSAY FOR ATP TO ANTIMICROBIAL DRUG SUSCEPTIBILITY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Emmett W. Chappelle, Baltimore; Grace L. Picciolo, Tantallon, both of Md.; Hillar Vellend, Newton Upper Falls, Mass.; Stephanie A. Tuttle, Watertown, Mass.; Michael J. Barza, Boston, Mass., and Louis Weinstein, Newtonville, Mass.

Filed Apr. 30, 1975, Ser. No. 572,991
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 K 15 Claims

1. A method for determining the sensitivity of bacteria to antimicrobial agents by measurement of the ATP index indicating sensitivity, which comprises:

culturing bacterium in a growth medium;

developing a uniform inoculum;

preincubating the inoculum for a period sufficient to initiate growth;

aliquoting at least three test portions, at least one test portion having an antibiotic added and at least two test portions without antibiotic added;

assaying the amount of bacterial adenosine triphosphate in the test portions, one assay on a test portion without antibiotic being made prior to any incubation, the other assays being made after incubation;

determining the ATP index to indicate sensitivity of the bacterium to the antibiotic;

the ATP index being determined according to the formula:

$$\text{ATP index} = B_t - A_o/A_t - A_o,$$

where

B_t represents a light reading for a test portion treated with antibiotic and allowed to incubate for a time t;

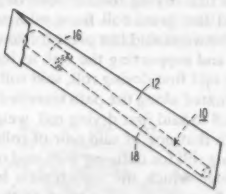
A_t represents a light reading for a test portion not treated with antibiotic and allowed to incubate for a time t; and

A_o represents a light reading for a test portion not treated with antibiotic and which is not allowed to incubate, at time zero.

4,014,746
METHOD OF AND APPARATUS FOR COLLECTING CULTURES

Donald J. Greenspan, Riverside, N.J., assignor to U.S. Medical Research and Development, Inc., Riverside, N.J.

Continuation-in-part of Ser. No. 358,350, May 8, 1973, Pat. No. 3,890,954. This application June 23, 1975, Ser. No. 589,521
The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl.² C12K *1/00*
U.S. Cl. 195—103.5 R 22 Claims



1. Apparatus for collecting cultures and the like comprising:

a hollow tubular container having a closed end, an open end and sides extending therebetween;

a culture-sustaining liquid positioned within the tubular container adjacent the closed end;

a swab including an elongated member and an absorbent tip; and

a barrier member extending across said tubular container so as to form a substantially leak-proof barrier between the

closed end and the open end, said barrier member including an opening adapted to permit said absorbent tip to pass therethrough into said liquid and form a seal around said elongated member.

21. An improved method of collecting cultures in a live condition utilizing an apparatus comprising a collection tube having sides and a bottom, a culture-sustaining liquid adjacent the bottom of said tube, a swab including an elongated member having an absorbent tip, and barrier means extending across said tube above said liquid, said barrier means having a self-closing opening therein, the improved method comprising the steps of:

swabbing an area of culturable material with the absorbent swabbing tip of the swab;

inserting the swab into the tube;

forcing the absorbent tip of the swab through the self-closing opening of the barrier means so as to permit the liquid to saturate the tip; and

forming a seal at said self-closing opening around said elongated member so as to substantially prevent the passage of air through said barrier means to said absorbent tip.

4,014,747

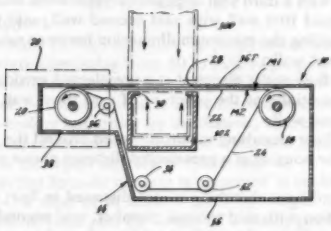
CARTRIDGE FOR A BACTERIA SCREENING DEVICE FOR CONTINUOUSLY MONITORING AND RECORDING THE EXISTENCE OF AIR BORNE BACTERIA AND OTHER MICROORGANISMS

Charles L. Kenyon, 15 MacArthur Drive, Old Greenwich, Conn. 06870

Filed Dec. 4, 1975, Ser. No. 637,832

Int. Cl.² C12B *1/02*; C12K *1/04*, *1/06*

U.S. Cl. 195—127 **9 Claims**



1. A cartridge for removable mounting in a screening device that detects and records the existence of bacteria and other microorganisms present in a gaseous medium, said cartridge comprising:

a. an outer casing;

b. a supply reel and a take up reel within said casing, at least one of said reels comprising means for engaging with and being driven by means on said screening device;

c. a strip comprising active culture medium on a surface thereof, said strip mounted to translate from said supply reel to said take up reel;

d. an exposure window permitting contact of said gaseous medium with a limited portion of said active culture when said cartridge is mounted in said screening device;

e. separating means for preventing contact between exposed portions of said active culture; and

f. shaped means coacting with heating means in said screening device to permit incubation heating of exposed portions of said strip.

4,014,748

ANAEROBIC CULTURE COLLECTING AND TRANSPORTING APPARATUS

Ernest Elliott Spinner, Grandview, Mo., and Myron Norton Slotsky, Overland Park, Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 22, 1975, Ser. No. 643,260

Int. Cl.² C12K *1/00*

U.S. Cl. 195—127 **26 Claims**

1. A culture collecting and transporting apparatus comprising:

an elongated tube having an open end with a removable closure thereon and an opposite closed end;

a swab having an absorbent swabbing tip located within said tube and having an elongated stem located adjacent the open end of the tube;

a first frangible ampoule disposed within said tube adjacent said swabbing tip, said ampoule containing a liquid nutrient medium which, when released from said ampoule, moistens said swabbing tip;

a gas producing agent located within said tube between the tube closed end and the nutrient medium ampoule;

a second frangible ampoule located within said tube adjacent said gas producing agent, said second ampoule containing an activating liquid which, when released from said second ampoule, flows into reactive contact with said gas producing agent to cause hydrogen to be generated within said tube; and

said tube being made of flexible material to enable the liquids in said ampoules to be released by squeezing the tube inwardly to rupture the ampoules; and

a filter located between said ampoules, said filter being gas permeable and liquid impermeable.

15. A culture collecting and transporting apparatus comprising:

a closable container having a collected culture receiving depot therein,

in the container a frangible rupturable ampoule containing a liquid nutrient medium to be supplied to a culture placed on the depot, and

chemical means in the container selectively activated after a culture is placed on the depot, said chemical means when activated supplying gaseous carbon dioxide, and a reducing agent system effective for reducing oxygen, at least in the container space surrounding the collected culture.

4,014,749

TUBE FURNACE FOR THE CRACKING OF ORGANIC FEED STOCK

Armin Dorner, and Walter Kreuter, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 22, 1974, Ser. No. 463,103

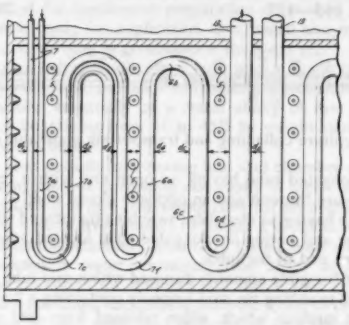
Claims priority, application Germany, Apr. 25, 1973, 2320872

Int. Cl.² C10G *9/20*; F22B *21/24*, *37/12*

U.S. Cl. 196—116 **4 Claims**

1. A tube furnace for the thermal cracking of hydrocarbon comprising a combustion chamber, a plurality of duct systems traversing said chamber for conducting a hydrocarbon therethrough, each duct system having an inlet side and an outlet side, each duct system comprising at said inlet side at least two tubes in said chamber of undulating configuration each with a plurality of loops in mutually parallel vertical planes for conducting said hydrocarbon in parallel and, at said outlet side, a common pipe in said chamber of undulating configuration with a plurality of loops in a vertical plane parallel to the

vertical planes of said tubes and communicating with said tubes, said tubes opening into and connected to said pipe and forming a junction therebetween, said pipe being of a flow cross section at least equal to that of said tubes at their junction with said pipe, said tubes and said pipes having substantially vertical stretches constituting the major part of their respective lengths, said chamber being of double-T cross



section in a horizontal plane and comprises a central compartment and a pair of end compartments lying transverse to said central compartment, two such duct systems being provided in said chamber with their respective tubes disposed in said end compartment and their respective pipes lying in said central compartment, said chamber being formed by vertical walls, burners being mounted on said walls, said loops lying in planes parallel to said walls.

4,014,750

SUPPORT APPARATUS FOR A BATTERY OF COKE OVENS

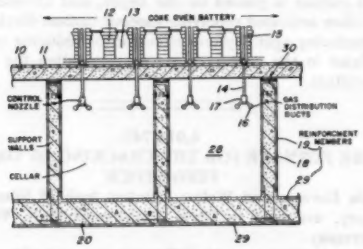
Wolfgang Franzer, Wattenscheid, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Jan. 22, 1975, Ser. No. 543,155

Claims priority, application Germany, Jan. 24, 1974, 2403266

Int. Cl.² C10B *1/06, 1/00;* **E04B** *1/68*

U.S. Cl. 202—139 **5 Claims**



1. In a battery of underjet coke ovens having battery decking positioned above a cellar within which ducts extend for supplying gaseous combustion media to the heating flues of the heating walls for the coking chambers forming said coke ovens, the cellar having ducts with nozzle members therein to control the flow of combustible gaseous media in the individual ducts to said flues, a support apparatus to carry said battery decking above said cellar comprising:

concrete support walls extending along only in a parallel direction with respect to the heating walls for the coke oven chambers, said concrete support walls including reinforcement members therein and providing the sole supports for said decking located there above;

a foundation slab including reinforcement members projecting into said concrete support walls, and

expansion joints including slip plates between said concrete support walls and said battery decking.

4,014,751

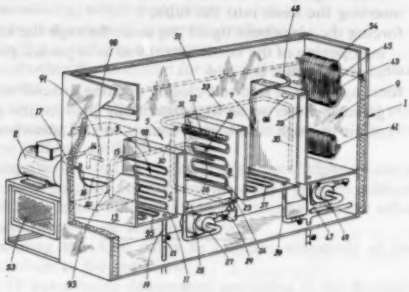
VAPOR GENERATING AND RECOVERING APPARATUS

James W. McCord, 9829 Timberwood Circle, Louisville, Ky. 40223

Filed June 13, 1975, Ser. No. 586,494

Int. Cl.² B01D *3/42*

U.S. Cl. 202—160 **16 Claims**



1. A vapor generating and recovering apparatus comprising:

a housing including at least two chambers therein, a first chamber for vaporizing a first component from a liquid solution containing at least two components therein and a second chamber for recovering said vapor in the form of a liquid;

heat emitting means disposed in heat emitting relation with said first chamber, said heat emitting means being disposed along and contiguous to a vertically extending first wall of said first chamber;

said first chamber having an opposed vertically extending second wall non-parallel to said vertically extending first wall with a third wall disposed therebetween and connecting said first wall with said second wall, said third wall extending the maximum dimension between said first and second walls;

a fluid flow outlet disposed at a preselected vertical position substantially at the juncture of said third wall with said second wall;

a first heat absorbing means disposed around the periphery of the housing at a preselected distance above said chambers;

a second heat absorbing means disposed in heat absorbing relation with said second chamber, said second chamber being disposed to collect said condensed vapors;

means to provide heat to said heat emitting means; and,

means to absorb heat from said heat absorbing means.

4,014,752

PROCESS AND ARRANGEMENT FOR VAPORIZING OF LIQUIDS

Gundolf Rajakovics, Vienna; Heinz Gabernig, Graz, and Günter Peter Klein, Vienna, all of Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Jan. 30, 1973, Ser. No. 328,065

Claims priority, application Austria, Feb. 2, 1972, 842/72

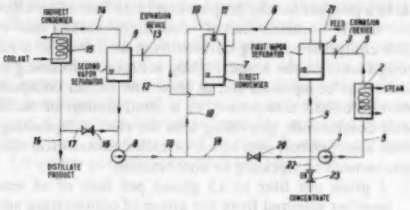
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B01D *3/00, 3/06*

U.S. Cl. 202—185 A **4 Claims**

1. In a process for vaporizing a radioactive liquid by a two-step vaporization technique employing first and second flash vaporization stages, wherein liquid is introduced to the first

vaporization stage to be circulated, heated and flash-evaporated and wherein vapor resulting from the flash evaporation of the liquid in the first vaporization stage is condensed in a first direct condenser, the improvement wherein the condensing step is accomplished by means of enriched liquid obtained from the second vaporization stage and applied via a circulation pump to the first condenser to form therein a



mixture of the enriched liquid obtained from the second vaporization stage and the condensate of the vapor from the first vaporization stage, and wherein the process further comprises the steps of the flash-evaporating said mixture in the second vaporization stage, and recycling a portion of the liquid emerging from the pressure side of the circulating pump to the first vaporization stage.

4,014,753

PROPYLENE OXIDE RECOVERY BY AZEOTROPIC DISTILLATION OF METHYL FORMATE-2-METHYLPENTANE

Werner Fuchs, Ludwigshafen; Rolf Platz; Norbert Rieber, both of Mannheim, and Andreas Scholz, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 21, 1973, Ser. No. 361,954

Claims priority, application Germany, May 26, 1972, 2225657

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.[2] B01D *3/34*

U.S. Cl. 203—1 **5 Claims**

1. A process for the recovery of propylene oxide from a liquid mixture containing from 60 to 99% of propylene oxide, up to 10% of acetaldehyde, up to 25% of methyl formate and up to 3% of 2-methylpentane in addition to minor amounts of other low-boiling impurities by distillation, wherein

a. the relative amounts of methyl formate and 2-methylpentane in the liquid mixture are determined,

b. the methyl formate content is corrected in such a way as to give a ratio of at least 4 parts by weight of methyl formate to each part by weight of 2-methylpentane,

c. the mixture is supplied to the feed point of a column having from 100 to 200 theoretical trays, which feed point is spaced by from 30 to 60 theoretical trays from the ends of the column, and

d. propylene oxide is recovered at the bottom of said column.

4,014,754

RECOVERY OF LACTAM SOLVENT FROM VINYL POLYMER SOLUTION

Rene P. Berni, Cliffside Park; Donald H. Lorenz, Basking Ridge, both of N.J., and Earl Pierce Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,716

Int. Cl.[2] B01D *3/34*; **B08B** *7/04*; **C07D** *210/00, 207/12*

U.S. Cl. 203—64 **19 Claims**

1. A method for the recovery of N-lower alkyl lactam solvent in which the lower alkyl group contains from 1 to about 7 carbon atoms from a solution of vinyl polymer in such solvent which comprises:

a. adding to said solution a plasticizer for said polymer, said plasticizer having a boiling point at least about 25° C above the boiling point of the lactam; and

b. then recovering said lactam from said solution by distillation.

4,014,755

METHOD OF REFINING PYROMELLITIC ACID DIANHYDRIDE

Günther Richter, Eichenkamp, Germany, assignor to Veba-Chemie AG, Gelsenkirch-en-Buer, Germany

Filed Feb. 11, 1974, Ser. No. 441,543

Claims priority, application Germany, Feb. 16, 1973, 2307570

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] C07D *307/89*

U.S. Cl. 203—73 **11 Claims**

1. Process for purification of crude pyromellitic acid dianhydride produced by vapor oxidation of 1,2,4,5-tetraalkylbenzene with an oxygen containing gas, having a purity of more than about 95% pyromellitic acid dianhydride, which comprises the following steps:

a. distilling said crude pyromellitic acid dianhydride at pressure of about 90–160 Torr, and temperature of about 290°–350°C to distill overhead an impurities-containing fraction amounting to less than about 20% of the crude introduced into step (a), and provide a residue enriched in pyromellitic acid dianhydride,

b. distilling the residue of step (a) at lower pressure which is 70 – 120 Torr and at temperature of about 290°–325°C to distill overhead the purified pyromellitic acid dianhydride, and provide and impurities-containing residue of less than about 12% of the crude introduced into step (a).

4,014,756

PROCESS FOR MAKING METAL POWDERS

Howard A. Fromson, 15 Rogues Ridge Road, Weston, Conn. 06880

Filed Jan. 21, 1976, Ser. No. 651,020

Int. Cl.[2] C25D *1/00, 1/20*

U.S. Cl. 204—10 **5 Claims**

1. Process for making metal powders which comprises:

a. electrolytically depositing discrete metal particles in the pores of a porous surface of an anodized aluminum article; and thereafter

b. liberating the metal particles from said pores by contacting the article from (a) with a substance that will attack the porous oxide surface but not the metal particles.

4,014,757

METHOD FOR PREPARING FIBROUS METAL MATERIALS BY ELECTROLYTIC DEPOSITION AND THE RESULTING FIBROUS METAL MATERIAL

Lucette Frechin, Darnac, France, assignor to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon sous Bagneux, France

Filed Sept. 5, 1975, Ser. No. 610,762

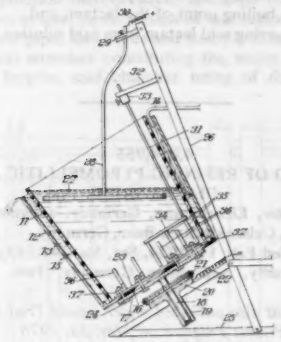
Claims priority, application France, Sept. 17, 1974, 74.31399

Int. Cl.[2] C25D *7/00, 17/16, 17/24*

U.S. Cl. 204—27 **6 Claims**

1. In a process for preparing fibrous metal material wherein the metal is electrolytically deposited on conductive fibres forming a skeleton, the improvement comprising continuously

carding the fibres during deposition of the metal thereof, said carding comprising subjecting said fibres to the action of at



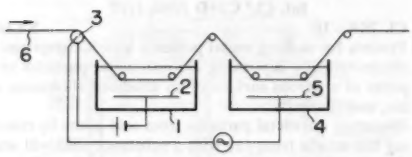
least two sets of teeth in relative movement with respect to each other.

4,014,758

CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS

Satoshi Kawai; Yoichi Yamagiwa, both of Chigasaki; Masashi Mizusawa, Fujisawa; Hiroshi Watanabe, Hiratsuka; Yoshio Ando, and Masaaki Takahashi, both of Tokyo, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,376
Claims priority, application Japan, Apr. 23, 1974, 49-46209
Int. Cl.² C25D 7/06
U.S. Cl. 204—28 9 Claims



1. A process for electrolytically treating aluminum or its alloy in the form of a strip, wire or foil material in a continuous manner which comprises continuously passing the material through an anodic oxidation treatment cell and an electrolytic coloring cell to carry out electrolysis in said cells to anodize and color the material in a continuous manner, characterized in that just prior to the anodizing stage, a circuit is formed by commonly connecting to the aluminum material a power source for anodizing and a power source for electrolytically coloring, said power source for anodizing being further connected to the anodizing cell and said power source for electrolytically coloring being further connected to the electrolytic coloring cell; said power source for anodizing being DC and the power source for electrolytically coloring being AC, or the power source for both of them being a single AC-superimposed direct current, whereby a current having an alternating wave form rich in positive component is supplied to the electrode of the electrolytic coloring cell.

4,014,759

ELECTROPLATING IRON ALLOYS CONTAINING NICKEL, COBALT OR NICKEL AND COBALT

Warren H. McMullen, East Brunswick, and Thomas J. Mooney, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed July 9, 1975, Ser. No. 594,214
Int. Cl.² C25D 3/56
U.S. Cl. 204—43 T 18 Claims

1. In a process for the preparation of an iron alloy electrodeposit which contains nickel, cobalt, or nickel and cobalt, which comprises passing current from an anode to a cathode through an aqueous acidic plating solution containing at least one ferrous compound and at least one nickel compound, at least one cobalt compound, or a combination of nickel and cobalt compounds, providing ions for electrodepositing nickel-iron alloy, cobalt-iron alloy, or nickel-cobalt-iron alloy, the improvement comprising in combination:

1. 1 gram per liter to 15 grams per liter of at least one member selected from the group of cooperating additives consisting of ascorbic acid, isoascorbic acid, and erythorbic acid; and
2. 0.01 gram per liter to 10.0 grams per liter of at least one compound exhibiting the formula

$$R'C_6H_4SO_2CHOHR$$

wherein R and R′ are each, independently, selected from the group consisting of hydrogen, alkyl, aralkyl, aryl, alkaryl and alkali metal derivatives thereof.

4,014,760

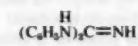
ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 525,714, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Feb. 17, 1976, Ser. No. 658,267
Int. Cl.² C25D 3/38
U.S. Cl. 204—52 R 14 Claims

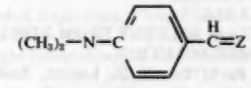
1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 gram per liter to 40 grams per liter of a aryl an selected from those exhibiting the formulae:



I.

and its reaction product with 3 moles of propane sultone per mole of amine,



II.

wherein Z is selected from the group consisting of oxygen and $-NCH_2-C_6H_5$; and

B. sulfoalkyl sulfide compounds containing the grouping $-S-Alk-SO_3M$ where M is one gram-equivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.1 milligrams per liter to 1000 milligrams per liter.

4,014,761
BRIGHT ACID ZINC PLATING

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

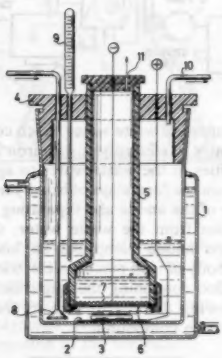
Filed Jan. 6, 1975, Ser. No. 538,602
Int. Cl.² C25D 3/22
U.S. Cl. 204—55 R 22 Claims

12. An aqueous acidic plating solution containing at least one zinc compound providing zinc cations for electroplating zinc said zinc compound selected from the group consisting of zinc sulfate, zinc chloride and zinc sulfamate; chloride anions added as salts of bath compatible cations excepting ammonium; in the absence of complexing or chelating agents of organic nature; and containing as cooperating additives from 1 to 30 grams per liter of at least one polyether surfactant, 0.025 to 1.0 gram per liter of at least one aromatic carbonyl compound, and, as a luster and leveling development agent, 0.1 to 2.0 grams per liter of sulfonated castor oil.

4,014,762
PROCESS FOR THE PREPARATION OF HEXAFLUOROPROPENE EPOXIDE

Hans Millauer, Eschborn, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 18, 1975, Ser. No. 641,930
Claims priority, application Germany, Dec. 20, 1974, 2460468
Int. Cl.² C25B 3/02
U.S. Cl. 204—79 3 Claims

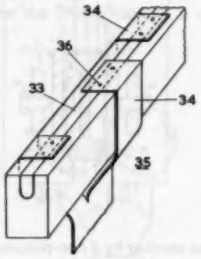


1. A process for preparing hexafluoropropane epoxide by oxidation of hexafluoropropene, which comprises submitting hexafluoropropene to anodic oxidation in an electrolytic cell having an anode space containing an electrolyte consisting essentially of a solution of glacial acetic acid and/or of acetonitrile with from about 2–40% by volume of water and about 1–10 weight %, calculated on the total solution, of at least one compound for improving the conductivity of the electrolyte, said compound being selected from alkali perchlorates, hexafluorosilicates, tetrafluoroborates, hexafluorophosphates nitrates, the free acids of such salts and mixtures of such compounds, the anode being composed of a metal of the platinum group or of its alloys or of PbO_2, the cathod being composed of a metal or graphite, and the cell being maintained at a temperature of from about −30° to +50° C.

4,014,763
CATHODE AND HANGER BAR ASSEMBLY AND ELECTROLYSIS THEREWITH

Bryan Wilfred Hodson Lowe, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Nov. 3, 1975, Ser. No. 628,557
Claims priority, application United Kingdom, Nov. 8, 1974, 48421/74
Int. Cl.² C25C 1/12, 7/02
U.S. Cl. 204—106 13 Claims



1. A cathode and hanger bar assembly comprising a two-component hanger bar having a substantially central core of a film forming metal selected from the group consisting of titanium, niobium, zirconium, tantalum, hafnium and alloys thereof and an outer sheath of aluminum or copper metallurgically bonded to the core, the aluminum or copper being relieved along the length of the hanger bar to reveal the film forming metal core and a continuous sheet of a film forming metal welded along one edge only to at least part of the film forming metal core.

9. An electrolytic cell incorporating a cathode and hanger bar assembly as claimed in claim 1.

10. A method of carrying out an electrolytic process which comprises the steps of locating an anode and a cathode in a solution containing ions of an electro-depositable metal, connecting the cathode negatively with respect to the anode and passing a current through the anode and cathode to deposit the metal on the cathode and remove the deposited metal from the cathode, characterized in that the cathode is in the form of a cathode and hanger bar assembly as claimed in claim 1.

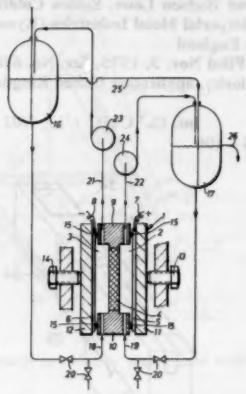
4,014,764
PROCESS FOR DESILVERING USED BLEACH FIX BATHS

Adolf Seiler, Hitdorf; Heinz Meckl, Schildgen, and Helmut Haseler, Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 17, 1972, Ser. No. 244,512
Claims priority, application Germany, July 8, 1971, 2134071
Int. Cl.² C25C 1/22
U.S. Cl. 204—109 5 Claims

1. A method for electrolytically recovering silver from spent aqueous bleach-fix photographic processing solution containing ions of both silver and iron III comprising introducing into said processing solution a chemical compound characterized by the ability to reduce iron III to iron II, impressing a direct electrical current between a cathode which is immersed in a first pool of such processing solution and an anode which is

immersed in a second pool of anolyte solution, thereby plating silver onto said cathode, said first and second pools being



separated from one another by a non-porous cation permeable barrier or a porous barrier, and excluding air from said pools.

4,014,765

METHOD FOR THE ELECTROLYTIC POLISHING OF THE INSIDE SURFACE HOLLOW NIOBIUM BODIES

Arthur Roth, and Otto Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

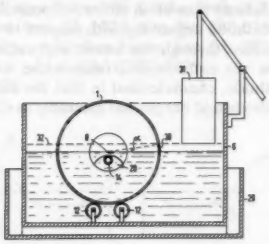
Filed Feb. 28, 1974, Ser. No. 446,956

Claims priority, application Germany, Mar. 15, 1973, 2313026

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C25F *3/30, 7/00*

U.S. Cl. 204—129.43 **9 Claims**



1. A method for the electrolytic polishing of the inside surface of a hollow niobium body, having at least one opening, in which method the hollow niobium body is partially immersed in an electrolyte, containing H_2SO_4, HF and H_2O, the niobium body being the anode in the electrolyte and supported for rotation about an axis of rotation extending through the opening such that for any position of the hollow niobium body, a coherent empty space in communication with the outside environment through the opening is present, said empty space being formed between the surface level of the electrolyte and all parts of the inside surface of the hollow niobium body located above the electrolyte level, in which method a cathode is introduced through the opening in the hollow niobium body and arranged in electrolyte relative to the hollow niobium body such that in the region of the electrolyte in which gases formed at the cathode during the flow of current are free to rise to the surface of the electrolyte and escape from the inside surface of the hollow niobium body without contacting any parts of the inside surface of the hollow niobium body immersed in the electrolyte, the steps of polishing including applying a constant electric voltage between the hollow niobium and the cathode such as to obtain damped oscillations imposed on the electrolyte current, switching off the voltage no later than at the point of complete decay of the current oscillations, maintaining the niobium body at rest until the oxide layer built up during the current oscillations is dissolved, rotating the niobium body and repeating these steps with the individual parts of the inside surface successively immersed in the electrolyte but such that no part of the inside surface remains continuously in the electrolyte, wherein the improvement comprises slowly rotating the hollow niobium body during a period of constant voltage application of approximately 0.7 to 4 minutes about its axis of rotation at a speed which is sufficiently low so that the width of the zone of the inside surface which has emerged by the time the voltage is switched off is is at most 5 mm so as to not disturb the development of the damped oscillations, and raising the level of the electrolyte after the voltage is switched off to cover at least the zone which has emerged during application of voltage whereby the full oxide layer formed will be dissolved.

4,014,766

ELECTROLYTIC TREATMENT OF WASTE WATER

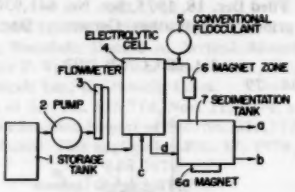
Yoshihisa Watanabe, and Naohiro Nojiri, both of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Oct. 23, 1975, Ser. No. 625,099

Claims priority, application Japan, Oct. 28, 1974, 49-124145; June 18, 1975, 50-73106; June 18, 1975, 50-73107

Int. Cl.² C02C *5/12;* **C25C** *1/10*

U.S. Cl. 204—152 **13 Claims**



1. In the treatment of waste water which comprises subjecting the waste water to electrolysis with iron as anode thereby to cause impurities in the waste water to aggregate within a floc resulting from the formation of iron hydroxide by electrolytic dissolution of the anode and separating the floc containing the impurities from the waste water, the improvement wherein the iron anode comprises an insoluble electrode material and a body of iron pieces in electrical contact therewith, and the floc containing the impurities is subjected to oxidation processing thereby to convert the iron hydroxide into a magnetic iron compound.

4,014,767

SELF-CONTAINED WASTE DISPOSAL SYSTEM INCLUDING SELF-CLEANING FILTER

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., New York, N.Y.

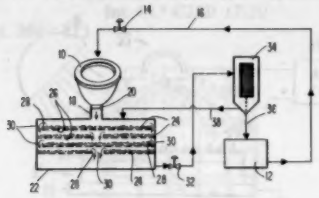
Filed Oct. 18, 1974, Ser. No. 515,915

Int. Cl.² C02B *1/82;* **C25B** *11/00*

U.S. Cl. 204—152 **10 Claims**

1. In a self-contained toilet and waste treatment system consisting of a toilet, a water flushing means and a waste treatment chamber comprising a comminuted redwood waste filter and digestion medium, the improvement comprising a final filter for further filtering the liquid effluent from said waste treatment chamber, said final filter consisting of first and second porous sheet electrically conductive elements

spaced apart from one another with a gas bubble impervious porous non-metallic spacer material between said elements, housing and channeling means for causing an electrolytic liquid to be filtered to flow successively through said first conductive element, said porous non-metallic spacer material



and said second conductive element, and means for causing an electrolytic current to flow between said elements with said first element as cathode and said second element as anode and thereby causing gas bubbles to be generated to be generated at said first element.

4,014,768

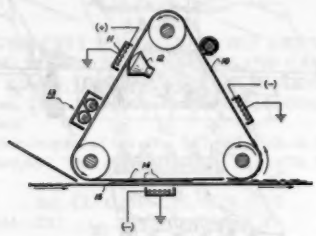
PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,444

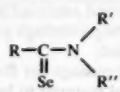
Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **1 Claim**



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein R, R′, and R″ are independently selected from hydrogen, alkyl of 1 to 10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and

b. subjecting said polymeric composition to sufficient energy to decompose said organoselenium compound whereby elemental selenium is deposited within the polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,014,769

PRODUCTION OF COFORMYCIN AND INTERMEDIATES THEREFOR

Hamao Umezawa; Kenji Maeda, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

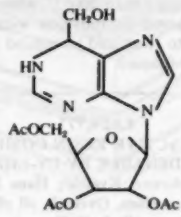
Division of Ser. No. 518,030, Oct. 24, 1974, Pat. No. 3,959,257. This application Jan. 21, 1976, Ser. No. 651,095

Claims priority, application Japan, Nov. 14, 1973, 48-127174

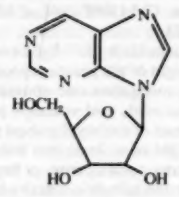
Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **3 Claims**

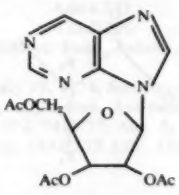
1. A process for the preparation of a compound of the formula:



in which Ac represents acetyl which comprises acetylating 9-β-D-ribofuranosylpurine of the formula:



with an acetylating agent to give the compound of the formula:



in which Ac represents acetyl and then reacting that compound with methanol under irradiation with ultra-violet light.

4,014,770

FOAM AND FLAME-BREAKABLE RESIN COMPOSITION

Kazuo Suzuki; Tsutomu Nanao, and Hiroshi Miyazaki, all of Otsu, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,826

Claims priority, application Japan, June 8, 1974, 49-65247

Int. Cl.² C08F *8/00, 2/54;* C08L *23/08*

U.S. Cl. 204—159.14 **3 Claims**

1. A foam and flame-breakable resin composition employed in an ordinarily unfoamed state, comprising

a blend of polyvinyl chloride and a copolymer of ethylene and vinyl acetate, said copolymer having a high melt

viscosity, a molecular weight of more than 200,000 and having a vinyl acetate component of from 40 to 80 weight percent of said copolymer, and said blend having a polyvinyl chloride to copolymer ratio of from 8:2 to 3:7;

a non-inflammable agent selected from the group consisting of diantimony trioxide and metal borate;

an auxiliary non-inflammable agent selected from the group consisting of chlorinated paraffin and ammonium salt of polyphosphoric acid;

an ash coagulating agent selected from the group consisting of boron compounds and lead compounds; and

a foaming agent selected from the group consisting of hydrazine suphate, aluminum hydroxide, magnesium carbonate, calcium carbonate, and other inorganic compounds having water of crystallization which is released at temperatures higher than 200° C, whereby contact of the normally unfoamed composition with fire causes said foaming agent to react and to expand and said composition to become foamed.

4,014,771

HIGHLY REACTIVE RESIN COMPOSITIONS HARDENABLE BY UV-LIGHT

Hans Jürgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bockum, and Artur Haus, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 510,466, Sept. 30, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,405

Claims priority, application Germany, Oct. 4, 1973, 2349979

Int. Cl.² C08F *2/48, 4/32*

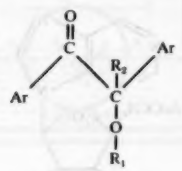
U.S. Cl. 204—159.23 **3 Claims**

1. A mixture hardenable by UV light comprising

A. 30–95% by weight of the reaction product of at least one epoxide having more than one epoxide group per molecule and acrylic acid, said reaction product containing about 0.6 to 1 mol of carboxyl groups per epoxide group;

B. 5–70% by weight of at least one tris-, tetra-, penta- or hexaacrylic or tris-, tetra-, penta- or hexamethacrylic acid ester of at least one trihydric, tetrahydric, pentahydric or hexahydric alcohol and

C. 0.2–10% by weight, based on the weight of (A) and (B), of a photoinitiator of the formula



wherein Ar is phenyl or said phenyl mono-substituted by alkyl, alkoxy or halogen; R_1 is alkyl having from 1 to 12 carbon atoms, cyclohexyl, tetrahydropyranyl or 1-methoxyethyl and R_2 is allyl, benzyl, halobenzyl or $—CH_2—CH_2—X$ wherein X is CN, $CONH_2$, or $COOR_3$ wherein R_3 is hydrogen or alkyl having 1 to 10 carbon atoms.

4,014,772

METHOD OF RADIATION HARDENING SEMICONDUCTOR DEVICES

Murray Henderson Woods, Los Gatos, Calif., and Richard Williams, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

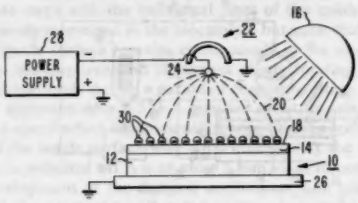
Filed Apr. 24, 1975, Ser. No. 571,261

Int. Cl.² C25D *1/12;* **G01N** *27/00*

U.S. Cl. 204—180 R **9 Claims**

1. A method for enabling a metal-dielectric-semiconductor device, having alkali metal as atoms or compounds, and alkali metal ions in the dielectric to avoid ionization of the alkali metal atoms or compounds by ionizing radiation comprising the steps of:

exposing the device to a flux of ionizing electromagnetic radiation sufficient to create alkali metal ions from the alkali metal atoms or compounds in the dielectric;



charging a surface of the dielectric with a negative charge; and

removing ions which have drifted to the surface of the dielectric.

4,014,773

APPARATUS FOR ELECTROLYTIC TREATMENT

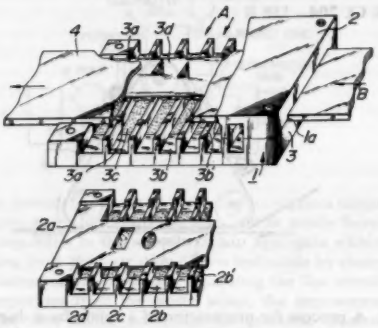
Kiyoto Furuya, Yokohama, Japan, assignor to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 15, 1975, Ser. No. 596,184

Claims priority, application Japan, July 31, 1974, 86911/74

Int. Cl.² C25D *17/00, 17/06, 7/06, 5/02*

U.S. Cl. 204—206 **17 Claims**



1. An apparatus for electrolytic treating elongated materials such as hoop materials, rods and wires comprising:

a casing having an opening for feeding the material to be treated;

a treatment unit consisting of first and second unit halves one upon the other and enclosed in said casing;

said unit halves including a through passage for feeding said material to be treated;

at least one insulating passage for flowing a treating liquid onto surfaces of said material to be treated as it is transferred through said through passage;

said insulating passage being made as a plurality of passages substantially perpendicular to said through passage and extending transversely across said material;

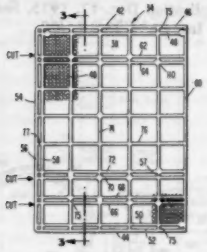
electrodes for causing electric current to flow between the electrodes and said material; and

at least one insulating shield between said insulating passages and said material for shielding portions of said material from being treated.

4,014,774
PLASTIC ELECTROPLATING BARREL WITH RIBBED PERFORATE MODULAR PANELS

Walter F. Noonan, Wallingford, Pa., assignor to Westlake Plastics Co., Lenni, Pa.

Division of Ser. No. 481,220, June 20, 1974, Pat. No. 3,953,633. This application Dec. 31, 1975, Ser. No. 645,643
Int. Cl.² C25D 17/20
U.S. Cl. 204—213 10 Claims

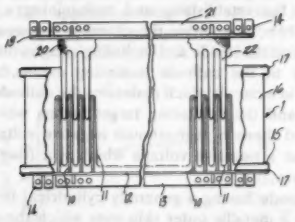


1. A polyhedral electroplating barrel having longitudinal rails forming the corners thereof, perforate panels forming the sides thereof and end heads, grooves in the rails receiving and retaining the longitudinal edges of adjacent perforate panels, interconnected recesses and grooves in the end heads receiving the end edges of the rails and panels and means securing the heads to the rails to form the rails, panels and heads in a tight assembly, said rails, heads and perforate panels being made of a thermoplastic resin, said perforate panels formed of separate substantially rectangular modules having a flat relatively thin perforate plate and intersecting reinforcing ribs upstanding therefrom, the lateral edges of the adjacent modules abutting each other in the final assembly.

4,014,775
DIAPHRAGM CELL HAVING UNIFORM AND MINIMUM SPACING BETWEEN THE ANODES AND CATHODES

Morton S. Kircher, Oakville, Canada, and Maynard F. Engler, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 547,062, Feb. 4, 1975, Pat. No. 3,960,697. This application Apr. 21, 1976, Ser. No. 678,896
Int. Cl.² C25B 1/10, 1/26, 9/00
U.S. Cl. 204—252 19 Claims

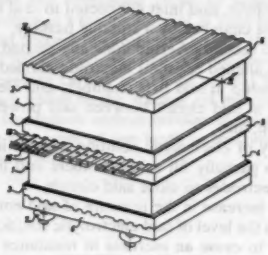


1. An electrolytic diaphragm cell comprising a cell body; an anode assembly having a plurality of foraminous metal anodes, a first section, and means of attaching said anodes to said first section; a cathode assembly having a plurality of foraminous metal cathodes, a second section, and means of attaching said cathodes to said second section; a diaphragm covering said cathodes; said first section and said second section sealingly attached to said cell body; and a continuous net interposed between and contacting said anodes and said diaphragm, said net spacing apart said anodes from said diaphragm by a uniform distance.

4,014,776
ELECTROLYTIC APPARATUS

Umberto Giacopelli, Rosignano-Solvay Leghorn, Italy, assignor to Solvay & Cie, Belgium

Filed July 1, 1974, Ser. No. 484,881
Claims priority, application Belgium, July 11, 1973, 133339
Int. Cl.² C25B 1/24, 9/02
U.S. Cl. 204—257 16 Claims

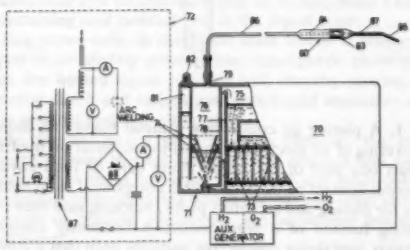


1. Electrolytic apparatus comprising upper and lower vertically stacked but separate monopolar electrolytic cells, each of said cells comprising side walls, generally vertical and parallel spaced cathodes supported by said side walls and generally vertical and parallel anode plates alternating with said cathodes, separator and collector means disposed generally horizontally between said cells and fluid-tightly segregating said cells from one another, means for feeding an electrolyte to each of the cells and for removing products of electrolysis from said cells, said separator and collector means comprising a current collector for feeding electric current to anode plates of both of said stacked cells, lower ends of anode plates of said upper cell and upper ends of anode plates of said lower cell being connected to said current collector, and means for connecting said current collector to an electric current supply means.

4,014,777
WELDING

Yull Brown, 182 Auburn Road, Auburn, New South Wales, Australia

Filed July 19, 1974, Ser. No. 489,921
Claims priority, application Australia, July 20, 1973, 4159/73; May 2, 1974, 7418/73; Aug. 3, 1973, 4341/73
Int. Cl.² C25B 1/02, 1/04
U.S. Cl. 204—270 6 Claims



1. Apparatus for generating a supply of hydrogen gas and oxygen gas in proportion to consumption of said gases comprising,

a. an electrolytic cell means for electrolytic generation of

said gases, said cell being enclosed to entrap said generated gases,

b. a gas outlet carried by said cell to allow a portion of said generated gases to discharge from said cell,

c. a source of electrical power connected to said cell by a suitable circuit, and

d. an electrical power regulating means for controlling the amount of power to said cell including:

a first chamber having a selected cross-sectional area and an upper and lower inlet, said upper inlet connected with said gas outlet of said cell,

a second chamber having a selected cross-sectional area at least one half less than that of said first chamber and a lower inlet, said inlet connected to said lower inlet of said first chamber by a suitable passage,

a first and second inverted conically-shaped and concentrically aligned resistant electrode carried in a vertical relationship in said first chamber, said electrodes connected in said circuit between said power source and said cell, and

a quantity of electrolytic solution carried in said chambers to partially fill said chambers and interface with said electrodes to close said circuit,

wherein an increase in the pressure of said entrapped gases depresses the level of said electrolytic solution in said first chamber to cause an increase in resistance of said electrodes thereby reducing the amount of power to said cell.

4,014,778

PLATING JIGS

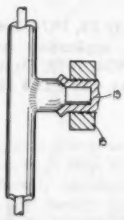
Norman Harrison, Sabden, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 9, 1975, Ser. No. 621,141

Claims priority, application United Kingdom, Oct. 16, 1974, 44790/74

Int. Cl.² C25D *17/06*

U.S. Cl. 204—297 W **2 Claims**



1. A plating jig comprising a metal frame, an impervious covering of an electrically insulating material on the frame, at least one part of the frame being bare of such covering to permit contact being made with a component to be held by the jig for plating and a contact piece enclosing said bare part and being formed of a non-conductive resiliently compressible matrix containing conductive particles such that a conductive path is established through the matrix wherever this is compressed, the contact piece being arranged to be compressed by contact with a component on the jig so as to establish an electrically conductive path between the frame and the component.

4,014,779

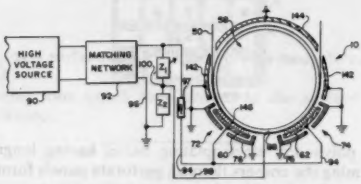
SPUTTERING APPARATUS

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 519,781, Nov. 1, 1974, and a continuation-in-part of Ser. No. 612,859, Sept. 12, 1975, said Ser. No. 519,781, is a division of Ser. No. 322,133, Jan. 12, 1973, Pat. No. 3,884,787, said Ser. No. 612,859, is a division of Ser. No. 436,444, Jan. 25, 1974, Pat. No. 3,905,887, which is a division of Ser. No. 322,968, Jan. 12, 1973, Pat. No. 3,829,373. This application Dec. 17, 1975, Ser. No. 641,481

Int. Cl.² C23C *15/00*

U.S. Cl. 204—298 **19 Claims**



1. A sputtering apparatus comprising:

A. a vessel with an entrance and having cathode mounting means secured therein adapted to have sputtering target means mounted thereto,

B. a closure for the vessel adapted to have its interior surface moved into sealing engagement with the entrance whereby to provide a sealed pressure chamber on the interior of the vessel when said closure is fully seated,

C. a rotary anode mounted on the said interior surface and flexible strip substrate transport means also mounted on the said interior surface and adapted to move substrate over said rotary anode on the interior of the vessel for sputtering material of the target means onto said substrate when said sputtering apparatus is in operation,

D. the closure and vessel walls being made of metal and adapted to be grounded,

E. groundable shielding means surrounding at least said target means when mounted on said cathode mounting means whereby to leave a sputtering opening facing the anode,

F. means for establishing and maintaining a sputtering plasma condition within the chamber between the target means and the anode and including a high voltage source coupled to the cathode mounting means, anode and ground in a circuit which maintains the cathode mounting means and the sputtering target means which may be mounted thereon at maximum negative voltage and the anode at a negative voltage which is a fraction of said maximum,

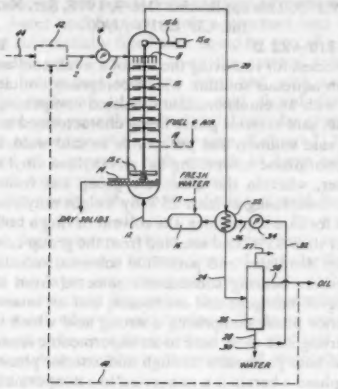
G. said anode having a generally cylindrical formation including a metallic outer skin over which the substrate is adapted to travel as the anode rotates, at least the said outer skin being insulated from said closure and vessel walls and there being a coaxially arranged contact ring carried by said anode and electrically connected with said at least outer skin, and

H. said apparatus including wiper contact means in sliding electrical contact with said ring at least when said closure is so engaged on said entrance and connected to said high voltage source to supply said fractional negative voltage to said anode.

4,014,780
RECOVERY OF OIL FROM REFINERY SLUDGES BY STEAM DISTILLATION

Drew E. McCoy, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,585
Int. Cl.² C10G 31/08
U.S. Cl. 208—13 5 Claims

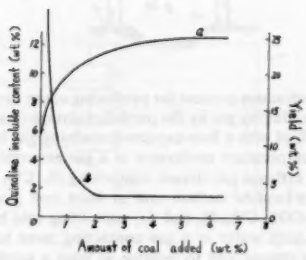


1. A continuous process for deoiling and dewatering refinery sludges which comprises:
   a. introducing the sludge into a heating zone,
   b. contacting the sludge in the said heating zone with steam thereby effecting separation of the sludge into an oil-water vapor phase and a dry, free-flowing solids phase,
   c. withdrawing from the upper part of the said heating zone the oil-water vapor phase and from the lower part the dry, free flowing solids phase,
   d. condensing the said oil-water vapor phase thereby forming a mixture of oil and water,
   e. separating and recovering water and oil from the said mixture, and wherein prior to introducing the sludge into the heating zone in step (a) about 0.5 to about 2.0 volumes of hydrocarbon oil are mixed with each volume of the sludge.

4,014,781
METHOD FOR PRODUCING PITCH AND COKE

Kozo Ueda, Kyoto, Japan, assignor to Osaka Gas Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 306,050, Nov. 13, 1972, abandoned. This application May 1, 1975, Ser. No. 573,423
Claims priority, application Japan, Nov. 27, 1971, 46-95570
Int. Cl.² C10B 55/00; C10G 9/00
U.S. Cl. 208—40 9 Claims

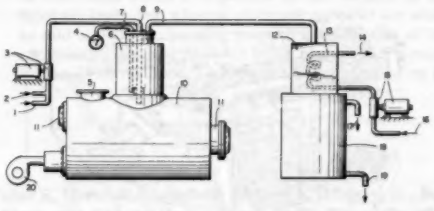


1. A method for producing high yields of coke and pitch without coking trouble by direct heat-treatment of a distillation residue of crude oil, said pitch having a high softening point and a high Conradsen carbon residue and said pitch and coke being useful as an additive to coking coal charge for producing coke which method comprises heating a starting feed selected from the group consisting essentially of a distillation residue of crude oil alone or together with a minor amount of recycle oil produced by the method having a boiling point not lower than 350° C in the presence of a powdery carbonaceous substance at a temperature of 350° to 600° C under an increased pressure of 5 to 50 kg/cm² gauge to produce pitch, coke and oil and separating the pitch and coke from the oil, said starting oil material being distillation residue of crude oil having a Conradsen carbon residue of 1 to 25 weight percent and containing 20 to 80 weight percent of substances boiling at a temperature of at least 600° C and less than 10 weight percent of substances boiling at a temperature lower than 350° C, said powdery carbonaceous substance having a Conradsen carbon residue of at least 50 weight percent and being added to the starting oil material in such an amount that Conradsen carbon residue of the carbonaceous material is in the range of one-tenth to ten times that of the starting oil material.

4,014,782
RESIDUAL FUEL DERIVING FROM PETROLEUM CRUDE BY THERMAL SHOCK CRACKING

Gregorio Cardenes Armas, Calle Paraguay 7, Las Palmas de Gran Canaria, Spain

Filed Jan. 23, 1975, Ser. No. 543,769
Claims priority, application Spain, Apr. 20, 1974, 425544
Int. Cl.² C01G 9/34
U.S. Cl. 208—130 6 Claims



1. A process for improving a residual fuel derived from the distillation of petroleum crude, said process comprising:
   heating a residual fuel derived from the distillation of petroleum crude to a temperature near its boiling point while maintaining said residual fuel in the liquid state;
   injecting water only, in the liquid state and at a pressure equal to or slightly greater than atmospheric pressure, into the heated liquid residual fuel, thereby causing a thermal shock and violent gasification and expansion of said residual fuel and water only;
   passing directly into a gas expansion chamber the gas formed by said thermal shock of said residual fuel and water only without having added thereto any other components or without having added thereto any other components or without undergoing any additional heating treatment;
   immediately thereafter continuously cooling said gas in a heat exchanger to form liquified gas without having added thereto any other components or without undergoing any additional heating treatment; and
   withdrawing said liquified gas as improved fuel free of impurities.

4,014,783

HYDROPROCESSING OF HYDROCARBONS

Richard E. Rausch, Mundelein, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 585,265, June 9, 1975, which is a continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application June 14, 1976, Ser. No. 696,165

Int. Cl.² C10G 23/04; B01J 23/58

U.S. Cl. 208—255 3 Claims

1. A process for hydrogenating a coke-forming hydrocarbon distillate containing di-olefinic and mono-olefinic hydrocarbons, and aromatics, which process comprises reacting said distillate with hydrogen, at a temperature below about 500° F., in contact with a catalytic composite of an alumina-containing refractory inorganic oxide, a platinum or palladium component, a rhodium component, a tin component and an alkali metal component, and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

4,014,784

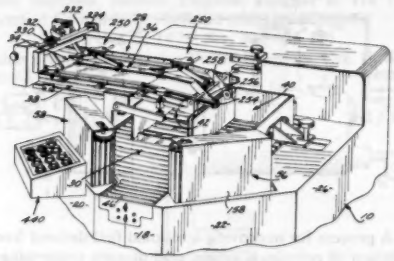
SORTING APPARATUS

Clifford E. Dunlap, Pasadena, Calif., assignor to W. A. Krueger Co., Scottsdale, Ariz.

Division of Ser. No. 457,367, May 2, 1974. This application Dec. 4, 1975, Ser. No. 637,526

Int. Cl.² B07C 5/344

U.S. Cl. 209—73 11 Claims



1. Automatic stacking apparatus for converting a generally continuous stream of generally flat objects into a series of successive stacks of said objects in response to a corresponding series of successive electrical shift signals, which comprises input means for receiving said stream of objects, first and second stacking bins adapted to alternately have said successive stacks dispensed therein, diverter means operatively disposed between said input means and said first and second bins, said diverter means being alternately shiftable between first and second positions wherein it directs said objects to the respective first and second bins, a source of a series of electrical shift signals, electrical diverter actuating means connected to said diverter means and to said source of shift signals for alternately shifting said diverter means between its said first and second positions in response to successive shift signals, means to remove completed stackes from said bins, and means responsive to said shift signals for controlling the operation of said stack removing means in correlation to the operation of said diverter.

4,014,785

NOVEL LIQUID MEMBRANE FORMULATIONS AND USES THEREOF

Norman N. Li, Edison; Gopal H. Singhal, Westfield, both of N.J.; Richard M. Minday, St. Paul, Minn., and Martin L. Gorbaty, Fanwood, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 492,616, July 29, 1974, Pat. No. 3,959,173. This application Oct. 9, 1975, Ser. No. 620,966

Int. Cl.² B01D 13/00

U.S. Cl. 210—22 D 17 Claims

1. A process for removing the salt of a weak acid and a weak base from aqueous solution which comprises contacting said solution with an emulsion, said emulsion comprising an exterior phase, said exterior phase being characterized as immiscible with said solution and permeable to said weak base, and said exterior phase comprising (a) an ethylene vinyl alkanoate copolymer, wherein the alkanoate group has from 1 to 20 carbons, comprising at least 25% by weight ethylene and (b) a solvent for said copolymer, the solvent having a boiling point of greater than 85° C and selected from the group consisting of petroleum distillates and paraffinic solvents including paraffinic solvents bearing substituents selected from the group consisting of halogens and aromatics, and an interior phase, said interior phase comprising a strong acid which is capable of converting said weak base to an impermeable from whereby said weak base permeates through said exterior phase into said interior phase wherein it is converted to a nonpermeable form, and removing said weak acid by passing an inert gas through said solution or subjecting the system to subatmospheric pressures, said removal being carried out at a temperature of from 75°–220° F.

4,014,786

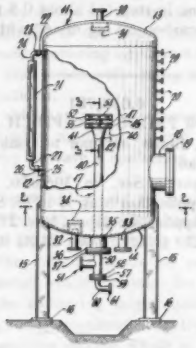
CARBON SEPARATION

Clyde E. Potter, Bellflower, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,704

Int. Cl.² B01D 43/00

U.S. Cl. 210—22 R 13 Claims



1. In a continuous process for producing clean synthesis gas, fuel gas, or reducing gas by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas in the presence of a temperature moderator in a gas generating zone to produce an effluent gas stream comprising H_2, CO, CO_2, H_2O, unreacted articulate carbon and at least one gas from the group H_2S, COS, CH_4, N_2 and Ar; contacting said hot effluent gas stream with water in a gas contacting zone to cool said effluent gas stream and to remove at least a portion of said particulate carbon, thereby producing a dispersion of particulate carbon and water; mixing a liquid organic extractant which is substantially immiscible with water with said particulate carbon-water dispersion in a mixing zone, thereby pro-

ducing a liquid feed mixture of particulate carbon, water and liquid organic extractant; and separating said liquid feed mixture by gravity into clarified water and a dispersion of particulate carbon and liquid organic extractant, which dispersion floats on said clarified water at the interface level; the improvement for separating said liquid feed mixture into said clarified water and said dispersion of particulate carbon and liquid organic extractant comprising:

1. introducing said liquid feed mixture of particulate carbon, water and liquid organic extractant into a closed vessel substantially filled with liquid by way of a horizontal radial nozzle located along the vertical axis of said vessel below said interface level and with said radial nozzle uniformly distributing said liquid feed 360°, wherein said vessel has a horizontal circular cross-section and is at a temperature in the range of about 212° to 650° F. and at a pressure high enough to keep said liquid organic extractant in liquid phase;
2. simultaneously with the introducing of said liquid feed mixture in (1), continuously separating by gravity the liquid feed mixture within said vessel into two liquid phases comprising a bottom layer of said clarified water and a top layer comprising said particulate carbonliquid organic extractant dispersion, thereby substantially filling said vessel, wherein said top layer floats on and contacts said bottom layer at the interface level, and said top layer has a carbon content in the range of about 0.5 to 9.0 weight percent;
3. simultaneously with the separating that takes place in (2), removing a continuous stream of said clarified water from an outlet in the bottom of said vessel and separate continuous stream of particulate carbon-liquid organic extractant dispersion from an outlet in the top of said vessel;
4. recycling said clarified water to said gas contacting zone to cool said effluent gas stream and to produce said dispersion of particulate carbon and water;
5. mixing said particulate carbon-liquid extractant dispersion from (3) with heavy hydrocarbonaceous fuel oil and introducing the resulting mixture into a distillation zone;
6. distilling off liquid organic extractant and recycling same to said mixing zone to produce said liquid feed mixture of particulate carbon, water and liquid organic extractant; and
7. introducing a bottoms slurry of carbon and heavy hydrocarbonaceous fuel from said distillation zone into said gas generating zone as a portion of the feed.

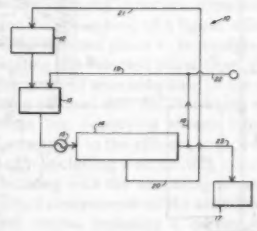
4,014,787
WASTEWATER TREATMENT

Jacob Shorr, Lexington, Mass., assignor to Systems Engineering & Manufacturing Corporation, Stoughton, Mass.

Continuation-in-part of Ser. No. 429,510, Jan. 2, 1974, abandoned. This application Sept. 5, 1975, Ser. No. 610,688

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 F **24 Claims**



1. A method of removing small particle size material in the form of heavy metal ions and contaminants of metal finishing and plating operations from wastewater feed containing no greater than about 4000 ppm of said heavy metal ions and contaminants, said method comprising,

combining said small particle size material with a combining agent at a pH of from 7.1 to 14 to form bound material having a particle size of at least 10 angstroms,

said combining agent being an inorganic metal hydroxide with the metal being selected from the group consisting essentially of iron, aluminum, tin, copper, zinc, cadmium, nickel, cobalt, silicon, lead, barium, calcium, manganese and chrome,

said combining agent being present in an amount of at least 1700 ppm and in a molar ratio of from 1:1 and above with respect to moles of the small particle size material yet in an amount permitting pumping of said wastewater,

and subsequently filtering said wastewater through an ultrafiltration skinned membrane at a flux at least as high as 30 gfd under pressure at least as high as 9 psig to separate said bound material from said wastewater.

4,014,788
REMOVING OF BARK FINES FROM AQUEOUS SUSPENSIONS

George Richard Bell, Larkspur, and Richard Seyb Lamar, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 9, 1975, Ser. No. 576,079

Int. Cl.² C02B *1/20*

U.S. Cl. 210—42 R **10 Claims**

1. In a hydraulic process for removing bark from logs which comprises removing the bark from the logs in the form of bark fines and flushing the bark fines away from the logs with water, such that an aqueous suspension of bark fines is formed, the improvement which comprises:

removing essentially all of said bark fines from said aqueous suspension by filtering said suspension with a rotary vacuum filter, wherein there is deposited on the outer surface of the drum of said rotary vacuum filter a filter aid layer comprising diatomite, and wherein said rotary vacuum filter also has rotating blade means for removing the layer of bark fines which is deposited on the surface of said filter aid layer, and wherein platy talc particles are added to said aqueous suspension prior to the filtration of said suspension, said talc particles being present in a concentration of about 2 to 10 weight percent talc based on the weight of dry bark fines in said suspension.

4,014,789
SEPARATION OF LIQUID PHASES

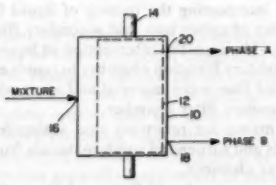
Walter R. Marshall, Bloomfield; Richard A. Gregory, Jr., Belle Mead, and Richard H. Handwerk, South Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 2, 1973, Ser. No. 356,470

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B01D *21/26*

U.S. Cl. 210—84 **4 Claims**



1. The process for effecting phase separation of relatively high and low viscosity immiscible liquids comprising: providing and maintaining, between inner means in relative rota-

tional movement with outer sleeve means, at least one zone of increased pressure constriction and of decreased pressure constriction; feeding a multi-phase mixture of relatively high viscosity and relatively low viscosity liquids to the interior of said sleeve means between said zones of increased and decreased pressure constriction; and withdrawing said high viscosity liquid and said low viscosity liquid from the vicinities of said zones of increased and decreased pressure constriction, respectively.

4,014,790

APPARATUS FOR RECYCLING FILTRATION MEDIA

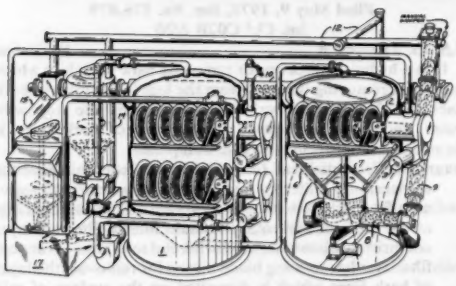
Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed Sept. 30, 1975, Ser. No. 618,138

The portion of the term of this patent subsequent to Dec. 12, 1989, has been disclaimed.

Int. Cl.² B01D *23/24*

U.S. Cl. 210—107 **10 Claims**



1. An apparatus for clarifying a liquid having suspended solids material therein and reusing the filter cake material comprising

means for passing contaminated liquid having suspended solids material therein through a first filter cake material bearing filtration means,

means for interrupting the passing of the contaminated liquid upon the accumulation of a predetermined amount of solids material,

means for removing the filter cake material and the accumulated solids into suspension in the contaminated liquid,

means for withdrawing the contents of the primary filter chamber into a secondary filter chamber and through a second filtration means,

second filtration means carried within a secondary filter chamber for removing the suspended filter cake material and solids material from said clarified liquid,

means for interrupting the passing of liquid from said primary filter chamber into said secondary filter chamber,

means actuable upon the interruption of liquid passing into said secondary filtration chamber to remove the collected suspended filter cake material and suspended solids into said secondary filter chamber,

conveyor means for removing said suspended filter cake materials and suspended solids materials from said secondary filter chamber,

means for removing liquid from said suspended filter cake material and suspended solids material, and discharging said dried materials, and

means for conveying said dried materials for introduction into said primary filter chamber.

4,014,791

OIL SEPARATOR

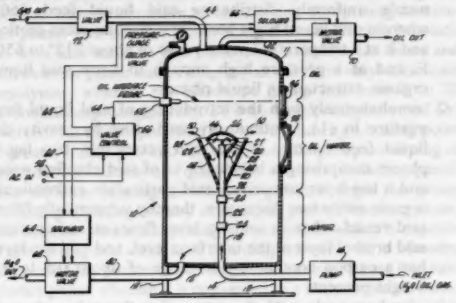
Ralph L. Tuttle, 7135 Hollywood Blvd., Hollywood, Calif. 90028

Continuation-in-part of Ser. No. 291,725, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 221,915, Jan. 31, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,221

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² B01D *21/24*

U.S. Cl. 210—114 **11 Claims**



1. Apparatus for separating oil and water from an oil-water mixture, comprising: a vessel, an inlet conduit extending upwardly into said vessel, said inlet conduit having a discharge port at the terminus thereof, deflector means stationed within said vessel in juxtaposition to said discharge port, said deflector means comprising means for intercepting fluid discharged from said port including first intercepting means stationed opposite said discharge port and second intercepting means stationed opposite said first means whereby fluid directed against said first means is once reversed and directed against said second means whence said fluid is again reversed in direction, a first outlet port near the bottom of said vessel for drawing off separated water from said vessel, a second outlet port near the top of said vessel for drawing off separated oil from said vessel, and control means coupled to said outlet ports for independently controlling the rate of outflow therefrom.

4,014,792

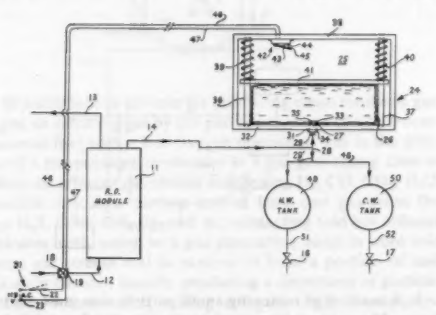
AIR AND LIGHT IMPERVIOUS WATER PURIFICATION AND PRODUCT DISPENSING SYSTEM

Charles W. Gossett, 14025 Crenshaw Blvd., Hawthorne, Calif. 90250, and William J. Dauenhauer, P.O. Box 487, Gualala, Calif. 95445

Filed June 14, 1976, Ser. No. 695,367

Int. Cl.² B01D *31/00*

U.S. Cl. 210—123 **5 Claims**



1. An air and light impervious water purification and prod-

uct distribution system comprising, in combination with a water supply line and with a reverse osmosis module connected into said line for recurrently receiving water from said water supply line and for removing impurities therefrom to provide a nearly pure water product at its outlet orifice, a faucetcontrolled water distribution line in communication with the nearly pure water product outlet orifice of said reverse osmosis module for dispensing the water product thereof, a box having an interior chamber therein, a reservoir within said box for storing the water product of said module, an inlet means establishing communication between said water distribution line and said reservoir for transmitting to and storing in said reservoir repetitive volumes of said nearly pure water product of said reverse osmosis module, a spring-loaded floating plate confined with such chamber, an electrical circuit, a switch connected into said circuit and secured to the top of said box within said chamber; said switch being adapted to be recurrently closed and opened by said floating plate upon the complete filling of said reservoir and emptying thereof, and solenoid-actuated valve connected into said water supply line for controlling the flow of water therein in response to the closing and opening of said electrical citcuit in which the solenoid of said solenoid-actuated valve is connected.

4,014,793

DETECTING APPARATUS FOR LIQUID CHROMATOGRAPHY

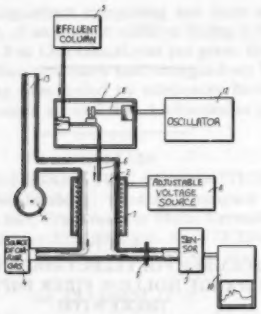
Karel Tesarik, and Milos Krejci, both of Brno, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed May 21, 1975, Ser. No. 579,683

Claims priority, application Czechoslovakia, May 21, 1974, 3601/74

Int. Cl.² B01D *15/08*

U.S. Cl. 210—198 C **5 Claims**



1. In a liquid chromatography detection apparatus for analyzing a selected non-volatile phase of a liquid effluent, comprising a sensor for the selected phase to be analyzed, conveying means for separating the selected phase from the effluent and for passing the separated selected phase to the sensor and means for introducing effluent into the conveying means, the improvement wherein the conveying means comprises, in combination, means coupled to the effluent source for atomizing the effluent, means including a separating column having a first end communicating with the atomizing means for volatilizing the non-selected components of the atomized effluent, a control valve, and means including a carrier gas source isolated from the introducing means and communicating with the separating column for propelling the non-volatilized selected phase from the separating column to the sensor through the control valve.

4,014,794

OIL FILTER ADAPTER

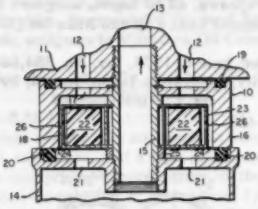
William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1974, Ser. No. 449,988

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B01D *35/00;* **C10M** *7/02*

U.S. Cl. 210—199 **4 Claims**



1. In combination with an oil filter, for use with an internal combustion engine using circulating oil, the improvement comprising an oil filter adapter, coaxial with and adjoining the oil filter, placed between the oil filter and the engine, said adapter comprising a casing having at least one opening to permit flow of oil from said engine to said adapter and at least one opening to permit flow of oil from said adapter to said filter and disposed in said casing in the path of the flowing oil and oil-soluble, solid oil viscosity index modifier and means in association with said modifier to limit contact of the surface of the modifier with the flowing oil wherein the solid copolymer is toroidal in shape and is encased in a perforated, oil insoluble metal shield.

4,014,795

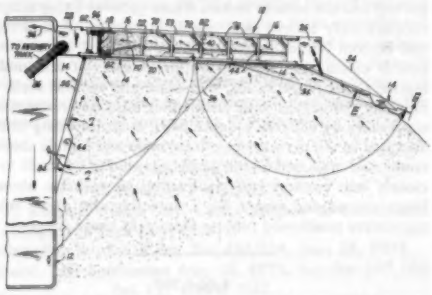
OIL BOOM FOR COLLECTING AND SKIMMING OIL ON A WATER SURFACE

Cornelis in't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,505

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 R **11 Claims**



1. An oil boom for collecting and skimming surface oil floating on a body of water, the boom comprising at least two generally parallel, elongated surface barrier screens having a density sufficient to cause the screens to float in water with a draft at least slightly greater than the maximum thickness of the floating oil layer; means for supporting the barrier screens within a surface current of water flowing towards the barrier screens in a direction generally transversely of their longitudinal direction; and flow diverter means located beneath the barrier screens for diverting at least a portion of said surface current towards one end of the boom and between said barrier screens, said flow diverter means comprising at least a single inclined flow diverting deflector element having at least a

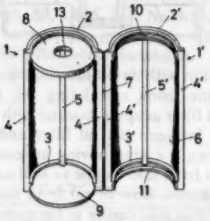
portion thereof angularly oriented relative to the principal horizontal and vertical axes of the oil boom, whereby oncoming surface current flowing towards the deflector element is diverted upwardly and laterally towards one end of the boom.

4,014,796

STRAINER

Masaaki Sugiyama, Fuji; Takuo Yuda, Sagamihara, and Akira Mizusawa, Fujisawa, all of Japan, assignors to Yamakawa Industry Company Ltd., Fuji and Nifco Inc., Tokyo, both of, Japan

Filed June 6, 1975, Ser. No. 584,664
Claims priority, application Japan, June 8, 1974, 49-65378
Int. Cl.² B01D *35/28*
U.S. Cl. 210—437 **5 Claims**



1. A strainer comprising:

a. a filter net,

b. a semi-cylindrical male shell having a pair of end supporters and a center supporter, top and bottom male frames of semi-circular shape connected with each other by said supporters and top and bottom boards of circular shape connected to said top and bottom frames and each presenting a substantially semi-circular lateral extension,

the top board having a through hole adapted to complimentarily accept a suction pipe therethrough,

c. a semi-cylindrical female shell having a pair of end supporters and a center supporter, and top and bottom female frames of semi-circular shape connected with each other by said supporters and groove means on the inside surface of each female frame,

the top and the bottom female frame grooves being adapted to cooperatively accept said lateral extensions of said top and said bottom boards therein respectively, said top and bottom boards closing the top and bottom frames of said male and female shells respectively, said male and female shells being movably connected with each other adjacent respective end supporters by suitable hinge means, said net being integrally attached to the peripheries of said male and female shells, said connected male and female shells adapted to be made to come closely into contact with each other by rotation about said hinge means and means for connecting the other said end supporters positioned remote from said hinge means.

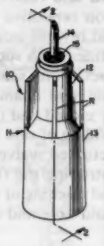
4,014,797

INTRAVENOUS INJECTION APPARATUS AND NEEDLE ADAPTER WITH FILTER AND METHOD OF MAKING SAME

Kenneth Raines, and George K. Burke, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Division of Ser. No. 423,682, Dec. 11, 1973, Pat. No. 3,970,084, which is a continuation-in-part of Ser. No. 299,268, Oct. 20, 1972, abandoned. This application May 20, 1975, Ser. No. 579,199
Int. Cl.² C02C *1/14*
U.S. Cl. 210—446 **6 Claims**

1. A needle adapter and filter therefor, comprising: a tubular housing having opposite ends and having a stepped axial bore therethrough defining an axially facing annular shoulder between the ends thereof; a tubular insert having opposite ends and having an axial bore therethrough and fitted coaxially within the bore through the housing, with the bore in the insert in axial alignment and registry with the bore in the housing, and one of said insert ends defining a flat, annular, surface normal to the axis of the insert, and substantially commensurate in size and shape with the shoulder; and a mesh filter having a generally dome-shaped central surface surrounded by a flat annular marginal section sealed and secured to said one end of the insert prior to positioning of the insert



in the bore of the housing for assembly of the insert and filter as a unit within the housing, the flat annular section of said filter coinciding with said flat annular surface of the insert, said annular section of said filter sealed to said flat annular surface of said insert, and said annular section of said filter further clamped between the insert end surface and the shoulder, thereby defining a relatively large annular seal area to effect a leakproof structure, whereby the filter filters contaminants or particulate matter from materials or solutions flowing through said adapter.

4,014,798

INSOLUBLE POLYELECTROLYTE AND ION-EXCHANGE HOLLOW FIBER IMPREGNATED THEREWITH

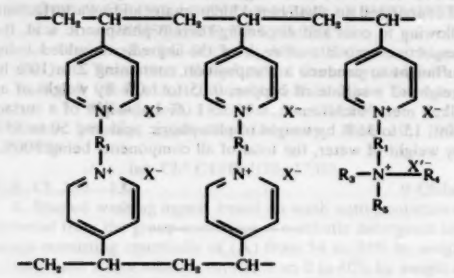
Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 4, 1974, Ser. No. 457,849
Int. Cl.² B01D *31/00, 13/00*
U.S. Cl. 210—500 M **10 Claims**

1. An ion-exchange medium comprising a hollow, annular, thin-walled microporous fiber having particles of polymer embedded and constrained within said pores, said particles being smaller than the diameter of said pores and said polymer comprising polyquaternary, water-insoluble, cross-linked polyer of vinyl pyridine and a dihalo organic compound of the formula:

$$X—R—X$$

where X is halo selected from the group consisting of bromo, chloro and iodo and R_1 is a divalent organic group; said polymer containing a structure of the formula:



where R_3 and R_4 are selected from lower alkyl of 1 to 10 carbon atoms, aryl, cycloalkyl of 1 to 10 carbon atoms, lower alkenyl, lower alkoxy or R_3 and R_4 are combined in a single aliphatic divalent group; R_5 is selected from hydrogen, R_3 or $-R_6-N(R_3)_2$ where R_6 is a divalent aliphatic or aromatic group of 2–10 carbon atoms and X^- and X'^- are selected from chloro , bromo or iodo said X^- and X'^- being ionized halo derived from $X-R_1-X$ with X^- groups ionized by quaternization with vinyl pyridine and X'^- groups ionized by post polymerization quaternization of said polymer with

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4,014,799

BROMOTRIFLUOROMETHANE-CONTAINING FIRE EXTINGUISHING COMPOSITION

Robert J. Owens, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 9, 1975, Ser. No. 566,423
Int. Cl.² A62D *1/00*
U.S. Cl. 252—8 **5 Claims**

1. A fire extinguishant comprising and from about 4% to 10%, by weight, of an organic additive having a heat of combustion of from 8 to 13.5 kilocalories per gram, the remainder being bromotrifluoromethane said extinguishant being useful for extinguishing fires fueled by substances having heats of combustion between about 2.5 to 5 kilocalories per gram.

4,014,800

FIBER-LUBRICATING COMPOSITIONS

Rolf Kleber, Neu-Isenburg, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 22, 1974, Ser. No. 472,224
Claims priority, application Germany, May 26, 1973, 2326966
Int. Cl.² D06M *13/36*
U.S. Cl. 252—8.8 **1 Claim**

1. A fiber-lubricating composition consisting essentially of a paraffin oil or silicone oil, an emulsifier and an amine oxide of the formula

in which R^1 is alkyl of 5 to 22 carbon atoms, R^2 is alkyl of 1 to 22 carbon atoms or a polyglycol group of the formula

$$-(CH_2CH_2O)_n-H$$

in which n is a number of 1 to 5, and R^3 is alkyl of 1 to 5 carbon atoms, or a polyglycol group of the formula

$$-(CH_2CH_2O)_m-H$$

in which m is a number of 1 to 10, the sum of n and m being not more than 10, with the proviso that R^3 is said polyglycol group if R^2 is alkyl of more than 5 carbon atoms.

4,014,801

PROCESS FOR BREAKING POLYMER-CONTAINING EMULSIONS

James H. Fullinwider, Englewood, Colo., and Bruce L. Knight, Findlay, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Filed Sept. 30, 1974, Ser. No. 510,190
Int. Cl.² B01D *17/04*
U.S. Cl. 252—8.55 D **20 Claims**

1. In a process of breaking an emulsion containing hydrocarbon, water, surfactant, and a high molecular weight polymer, the step comprising incorporating in the emulsion an aqueous solution comprising at least about 1,000 ppm of a chloride salt hydrate or a mixture thereof of a divalent cation wherein the cation is calcium, cadmium, manganese or magnesium fluoride is chloride, bromide, iodide or fluoride and at least about 1,000 ppm of a strong oxidizing agent selected from the group consisting of lithium, sodium, potassium and ammonium hypochlorites and hypobiomites.

4,014,802

OIL-IMPREGNATED SINTERED PRODUCT AND METHOD OF PRODUCING SAME

Hiroshi Seino, Yokohama; Norio Yamada, Yokosuka; Shigeo Kimura, Fujisawa; Hideaki Kosugi, and Koreyuki Yamamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 18, 1973, Ser. No. 380,137
Claims priority, application Japan, July 19, 1972, 47-71573
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² C10M *5/00*; F16D *69/00*; C10M *7/00*
U.S. Cl. 252—12.2 **3 Claims**

1. A shaped product of a sintered metal powder subject to rotational movement at relatively high speeds about an axis of rotation extending through the product, comprising an oil-impregnated layer which is circumferentially disposed about said axis of rotation; said oil-impregnated layer having an exposed and self-lubricating surface directed toward said axis of rotation and extending therealong; and a resin-impregnated layer contiguous to said oil-impregnated layer and encompassing the same except along the exposed surface thereof; whereby a movement of oil, outward and away from said oil-impregnated layer, due to centrifugal forces caused by the high speed rotation of the product is prevented.

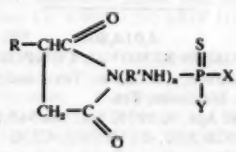
4,014,803

LUBRICANT ADDITIVE

Hugh E. Romine, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 484,024, June 28, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,158
Int. Cl.² C10M *3/42*
U.S. Cl. 252—32.7 R **22 Claims**

1. Compounds represented by the formula



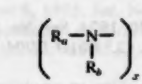
wherein

R is an alkenyl group containing about 10 to about 100 carbon atoms,

R′ is an alkylene group containing 1 to about 5 carbon atoms,

n is an integer of 1 to 4,

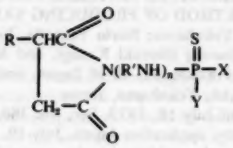
X is selected from the group consisting of NH_2, NHR″, NR″R″, and OR″, wherein R″ is a C_1–C_{16} alkyl group, phenyl, mono- or dialkyl substituted phenyl, wherein the alkyl group contains 1 to 16 carbon atoms, or alkylene polyamino containing 1 to 20 carbon atoms and being represented by the formula



wherein R_b is hydrogen or a C_1–C_3 alkyl group, R_a is an alkylene group containing 1 to 8 carbon atoms, and *x* is an integer in the range of 1 to 10, and

Y is selected from the group consisting of NHR″, NR″R″, OR″, chloride, and bromide, wherein R″ is as defined for X.

8. A lubricating oil composition comprising a major amount of a mineral or synthetic base lubricating oil and an effective amount in the range of from about 0.1 to about 20 weight percent of compounds represented by the formula



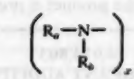
wherein

R is an alkenyl group containing about 10 to about 100 carbon atoms,

R′ is an alkylene group containing 1 to about 5 carbon atoms,

n is an integer of 1 to 4,

X is selected from the group consisting of NH_2, NHR″, NR″R″, and OR″, wherein R″ is a C_1–C_{16} alkyl group, phenyl, mono- or dialkyl substituted phenyl, wherein the alkyl group contains 1 to 16 carbon atoms, or alkylene polyamino containing 1 to 20 carbon atoms and being represented by the formula



wherein R_b is hydrogen or a C_1–C_3 alkyl group, R_a is an alkylene group containing 1 to 8 carbon atoms, and *x* is an integer in the range of 1 to 10, and

Y is selected from the group consisting of NHR″, NR″R″, OR″, chloride, and bromide, wherein R″ is as defined for X.

4,014,804

CORROSION REMOVAL COMPOSITION

Gordon B. Anderson, Dickinson, Tex., assignor to Gultex, Incorporated, Dickinson, Tex.

Filed Apr. 4, 1975, Ser. No. 565,146

Int. Cl.[2] **C02B** *5/02*; **C11D** *7/08*; **C23G** *1/04*, *1/08*

U.S. Cl. 252—85 **12 Claims**

1. A method for preparing a corrosion removing composition, said method comprising heating water to a temperature of 140° to 160° F, dissolving therein while agitating, a sulfate of copper and an alkali metal bichromate, adding a surfactant, allowing to cool and dispersing therein phosphoric acid, the respective amounts of each of the ingredients added being sufficient to produce a composition containing 2 to 10% by weight of a sulfate of copper, 0.05 to 1.0% by weight of an alkali metal bichromate, 0.05 to 1.0% by weight of a surfactant, 15 to 35% by weight of phosphoric acid and 50 to 85% by weight of water, the total of all components being 100%.

4,014,805

DRY CLEANING FORMULATION

Harry Marcus Castrantas, New Town, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 28, 1975, Ser. No. 636,077

Int. Cl.[2] **C11D** *7/54*

U.S. Cl. 252—104 **9 Claims**

1. An improved dry cleaning formulation which minimizes equipment corrosion and maintains fabric strength while effectively removing hydrophilic stains consisting essentially of:

a. about 0.1% to about 30% by weight water;

b. about 0.08% to about 12% by weight water-soluble inorganic polyphosphate salt based on the weight of water;

c. about 0.003% to about 0.13% by weight hydrogen peroxide to provide about 0.05% to 2.0% W.O.F. hydrogen peroxide;

d. about 0.1% to about 5% by weight of a suitable detergent capable of emulsifying the water present in the dry cleaning bath in the solvent and which does not react with hydrogen peroxide or an inorganic polyphosphate salt; and

e. the remainder being at least 69% by weight non-aqueous dry cleaning solvent; and having a pH value from 5.0 to 9.0.

4,014,806

NOVEL ORGANOPOLYPHOSPHATES IN AQUEOUS CLEANING COMPOSITIONS

David Connor, Ben Y Groes, Swallow Hill, Disington, Cumberland, England; Francesco Cuciti, Via Wildt 7, 40043 Castiglione delle Stiviere, Mantova, Italy, and Edward James Lowe, Four Locks House, Stourton, near Stourbridge, Worchestershire, England

Filed Dec. 7, 1973, Ser. No. 420,579

Int. Cl.[2] **C11D** *3/065*, *3/30*, *3/36*, *17/08*

U.S. Cl. 252—110 **1 Claim**

1. An aqueous cleaning composition consisting essentially of about 10% by weight of said composition of dodecyl benzene sulphonic acid, about 6% of triethanolamine, about 3% of monoethanolamine, about 2.7 of a 27% aqueous solution of ethoxylated sodium laurel sulphate containing three ethylene oxide groups per molecule, about 4% of coconut fatty acid about 6% of a polyphosphate consisting of 36.75% by weight P_2O_5 and 63.25% by weight monoethanolamine produced by reacting a polyphosphoric acid containing said P_2O_5 with monoethanolamine, about 2% of polyglycol condensate, and the remainder essentially water; said polyphosphate having been obtained by forming (i) an aqueous polyphosphoric acid solution comprising 82 to 86% by weight of phosphoric pentoxide, and (ii) reacting said phosphoric acid solution with monoethanolamine at a pH of from 4 to 12 and at a temperature from 15° to 70° C.

4,014,807

SHAPED WASHING AGENTS HAVING AN IMPROVED RESISTANCE TO CRACKING

Lothar Werner, Krefeld-Bockum; Albert Weingartz, Moers, and Jutta Trautvetter, Rheydt, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed June 4, 1975, Ser. No. 583,670

Claims priority, application Germany, June 10, 1974, 2427986

Int. Cl.² C11D *3/30, 17/00*

U.S. Cl. 252—132 9 Claims

1. Shaped washing agents based on wash active substances selected from the group consisting of synthetic detergents and soaps consisting essentially of (A) from 54 to 94% by weight of said wash active substances, (B) from 0 to 40% by weight of non-wash active substances customarily incorporated in shaped washing agents, (C) from 5 to 15% water, and (D) from 1 to 10% by weight, of a compound supplying resistance to cracking selected from the group consisting of branched-chain alkanols having from 12 to 20 carbon atoms and di-octyl adipate having up to 50% of n-octyl.

4,014,808

DETERGENT COMPOSITION

Ferdinand J. Herpers, Jr., Minnetonka, and Daniel I. Untiedt, Crystal, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 366,441, June 4, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,264

Int. Cl.² C11D *3/066*

U.S. Cl. 252—135 11 Claims

1. A detergent composition consisting essentially of a formulation prepared with the following composition:

Component	Content
(a) an alkaline builder selected from the group consisting of sodium tripolyphosphate, mixtures of sodium tripolyphosphate with an alkaline agent selected from the group consisting of potassium hydroxide, sodium sulfate and sodium carbonate; trisodium phosphate, tetrasodium pyrophosphate, tetrapotassium pyrophosphate, sodium hydroxide, nitrilotriacetic acid, sodium citrate, potassium citrate and combinations thereof	5% to 75%
(b) a wetting agent selected from the group consisting of a mixture of mono and polyglucosides of a mixed alcohol having from 8 to 10 carbon atoms and nonylphenoxy poly (ethyleneoxy) ethanol	0.5% to 30%
(c) a flocculant selected from the group consisting of polydiallyl-dimethyl ammonium chloride of average molecular weight of about 100,000 and polyacrylamide of average molecular weight of between about 2 million and 15 million	2% to 40%

4,014,809

PROCESS FOR OBTAINING A POLYOL-CONTAINING HOMOGENEOUS LIQUID COMPOSITION USEFUL FOR THE PRODUCTION OF RIGID POLYURETHANE FOAM FROM A RIGID POLYURETHANE FOAM

Osamu Kondo; Torao Hashimoto, and Hajime Hasegawa, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,634

Claims priority, application Japan, Dec. 19, 1974, 49-144995

Int. Cl.² C09K *3/00;* B29H *19/00;* C08J *11/04*

U.S. Cl. 252—182 5 Claims

1. A process for obtaining a polyol-containing homogeneous liquid composition, which can be directly reused as a polyol component for the production of rigid polyether polyurethane foam, from a rigid polyurethane foam, which comprises treating said rigid polyurethane foam at a temperature of from 150° to 220° C in the presence of a mixture of (a) an aliphatic diol having 4–7 carbon atoms and having a boiling point higher than 160° C and (b) a monoalkanolamine having 2–8 carbon atoms, the amount of said monoalkanolamine (b) present in said mixture being within the range of from 1 to 20 percent by weight.

4,014,810

DEPOLARIZER MASS FOR GALVANIC PRIMARY CELLS

Winfried Krey, Ellwangen-Neunheim, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 503,312, Sept. 5, 1974, abandoned. This application Mar. 9, 1976, Ser. No. 665,253

Int. Cl.² H01M *4/08*

U.S. Cl. 252—182.1 5 Claims

1. A method of making a depolarizer mass for a primary cell having solid ingredients and containing substantially the entire electrolyte used in the cell, said method comprising the steps of:

mixing with the electrolyte a hydrophobic agent in the form of an oil-in-water emulsion, the emulsion containing a small quantity of emulsifier, and the electrolyte having an ingredient which acts as demulsifier and causes the breakdown of the emulsion in the mixture;

mixing into a homogeneous depolarizer mass the solid ingredients and the mixture of electrolyte and hydrophobic agent emulsion before the emulsion in the electrolyte-agent mixture has had time to break down, in such proportions that the electrolyte content of the mass is at least about 25% by weight, the emulsion breaking down in the mass and the hydrophobic agent depositing gradually on the solid ingredients; and

said hydrophobic agent being mixed into the electrolyte-agent mixture in the proportions of about 0.02% to 0.5% by weight relative to the solid ingredients.

4,014,811

NEMATIC LIQUID CRYSTAL COMPOSITIONS

Kazuo Totani; Goro Matsumoto; Kazuhito Iwasaki, and Toshio Jinnai, all of Kamakura, Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

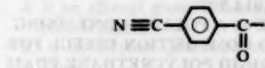
Filed June 6, 1975, Ser. No. 584,662

Claims priority, application Japan, Dec. 28, 1974, 50-665

Int. Cl.² C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 5 Claims

1. A nematic liquid crystal composition consisting essentially of (A) a mixture in equal parts by weight of p-cyanophenyl-p′-n-butylbenzoate, p-cyanophenyl-p′-n-hexylbenzoate and p-cyanophenyl-p′-n-octylbenzoate and (B) at least one of p-n-alkylphenyl-p′-cyanobenzoates selected from the group consisting of p-n-butylphenyl-p′-cyanobenzoate, p-n-hexylphenyl-p′-cyanobenzoate and p-n-octylphenyl-p′-cyanobenzoate



said component B being present in an amount of not more than about 30% by weight based on the total amount of the composition.

4,014,812
METHOD OF PREPARING RARE EARTH PYROHAFNATE PHOSPHORS

Paul V. Kelsey, Jr., Blacksburg, Va., and James E. Mathers, Ulster, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 509,286, Sept. 25, 1975, abandoned. This application May 19, 1975, Ser. No. 578,763
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.4 F **1 Claim**

1. A method of making a luminescent composition of matter having the general formula $(A_{1-x}RE_x)_2Hf_2O_7$ wherein A is selected from the group consisting of yttrium, gadolinium, lanthanum, scandium, and lutetium and RE is selected from the group consisting of praseodymium, samarium, europium, terbium, dysprosium, holmium, erbium, and thulium, and x is from about 0.001 to 0.10, which comprises the steps of: dissolving effective amounts of an oxide of A and an oxide of RE in hydrochloric acid to form a first solution, said effective amounts being sufficient to achieve luminescene in the finished composition; dissolving $HfOC_2$ in water to form a second solution; combining said first and second solution to form a third solution; adding to said third solution an oxalic acid precipitating agent to form a precipitate; separating said precipitate and washing with water to a neutral pH; filtering and drying said precipitate; first firing said precipitate at a temperature of about 950° C for about 2hours in a high density alundum crucible; and, mortaring and refiring at about 1480° C for about 8hours to produce said luminescent composition.

4,014,813
HAFNIUM PYROPHOSPHATE PHOSPHORS AND METHODS OF PREPARATION

Igal Shidlovsky, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 439,541, Feb. 4, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 539,906
Int. Cl.² C09K *11/08*; C01B *25/26*
U.S. Cl. 252—301.4 P **14 Claims**

1. A luminescent material consisting essentially of hafnium pyrophosphate, wherein 0 to 20 mole percent of said hafnium is replaced with at least one member of the group consisting of zirconium, germanium and silicon, said luminescent material exhibiting a peak luminescence in the range of 2600 to 3000 A.

9. A method for preparing a luminescent material comprising mixing together a hafnium compound and a phosphate compound, heating said mixture in air at temperatures between 400° and 1000° C whereby said mixture reacts, cooling said reacted mixture to room temperature, and then heating said reacted mixture at temperatures between 1000° and 1300° C in air for at least 30 minutes thereby forming a luminescent hafnium pyrophosphate having a peak luminescence in the range of 2600 to 3000 A.

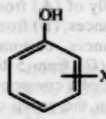
4,014,814
CORROSION INHIBITOR COMPOSITION

David C. Zecher, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 30, 1975, Ser. No. 600,755
Int. Cl.² C09K *3/00*; C23F *11/00*
U.S. Cl. 252—389 A **14 Claims**

1. A corrosion inhibitor composition for water systems consisting essentially of:

a. a water-soluble phenolic resin prepared by reacting a phenol having the ortho and/or para position blocked and of the general structural formula



wherein n is 1–3 and each X is in the ortho or para position and is independently selected from the group consisting of —OH, —COOH, hydrogen, $—SO_3H$, $—NH_2$ and alkyl and alkylene radicals which have up to 8 carbon atoms and an aldehyde of the formula

wherein R is selected from the group consisting of hydrogen and lower aliphatic groups having less than 5 carbon atoms; and

b. a polyphosphate selected from the group consisting of inorganic polyphosphates having a molar ratio of at least one of alkali metal oxide, alkaline earth metal oxide, zinc oxide to P_2O_5 of about 0.4/1–2/1, and their corresponding acids having a molar ratio of water to P_2O_5 of about 0.4/1–2/1 and polyfunctional acid phosphate esters of a polyhydric alcohol, said esters having the formula $R—(O-PO_3H_2)_x$ wherein R is the organic residue of a polyhydric alcohol and x is a number from 2 to 6.

4,014,815
REMOVAL OF CARBON AND VANADIUM OR LEAD FROM SPENT CATALYSTS BY MEANS OF CONTROLLED HIGH TEMPERATURE TREATMENT WITH SULFUR

Fred R. Gamble, Jr., Murray Hill, N.J., and Ricardo B. Levy, Los Altos, Calif., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 19, 1975, Ser. No. 588,401
Int. Cl.² B01J *37/00*
U.S. Cl. 252—412 **24 Claims**

1. A process for selectively removing vanadium and carbon contamination from supported metal catalyst systems, which supported metal catalyst systems are selected from the group consisting of Group VI metals, Group VIII metals and bi and tri combinations thereof on a refractory oxide support, which process comprises the steps of:

a. contacting the contaminated supported metal catalyst system with an elemental sulfur vapor atmosphere at a temperature between 400° to 825° C, and a sulfur pressure of at least 0.10 atmospheres for a time sufficient to selectively form volatile vanadium and carbon sulfides;

b. removing the volatile vanadium and carbon sulfides from the supported metal catalyst system.

17. A process for selectively removing vanadium and carbon contamination from supported metal catalysts, which supported metal catalysts are selected from the group consisting of Group VI metals, Group VIII metals and bi and tri combinations thereof on a refractory oxide support, which comprises the steps of:

a. contacting the contaminated supported catalyst system with liquid sulfur at a temperature of between 300°–825° C;
b. forming soluble carbon and vanadium sulfides on the supported metal catalyst,
c. dissolving the soluble carbon and vanadium sulfides in the liquid sulfur;
d. removing the dissolved soluble carbon and vanadium sulfides from the supported metal catalyst system.

4,014,816

SILANE ADJUVANT FOR CHROMIUM OXIDE CATALYST

John P. Hogan; Benny E. Nasser, both of Bartlesville, and Joseph A. Delap, Dewey, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 526,158, Nov. 22, 1974, Pat. No. 3,939,137. This application Oct. 16, 1975, Ser. No. 623,123

Int. Cl.² B01J *31/02*; C08F *210/00*, *110/02*

U.S. Cl. 252—430 6 Claims

1. A catalyst which is prepared by mixing a calcined support containing chromium in the form of chromium oxide at least a part of said chromium being in the hexavalent state and a silane of the formula $R_{4-n}SiH_n$ wherein n is an integer from 0 to 3 and R is a saturated or unsaturated hydrocarbon group containing from 1 to about 10 carbon atoms per molecule selected from alkyl, alkenyl, aryl, aralkyl, alkaryl, and cycloalkyl.

4,014,817

MANUFACTURE OF ACTIVATED CARBON FROM SIZED COAL

Bruce C. Johnson, Grand Forks, N. Dak.; Rabindra Kumar Sinha, Coraopolis, and John Emery Urbanic, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1975, Ser. No. 564,929

Int. Cl.² B01J *21/18*, *37/00*; C10B *53/04*

U.S. Cl. 252—445 7 Claims

1. An improved method of making granular activated carbon comprising (a) crushing and separating to a size in the range of 2 × 40 U.S. Sieve Series, a coal having an ASTM rank of High Volatile C Bituminous, Subbituminous and Lignite, and having greater than 10 percent by weight bed moisture and greater than 10 percent by weight oxygen content; (b) heating said crushed and separated coal in air at a temperature of from about 150° C. to about 215° C. for a period of from 30 minutes to 18 hours, whereby from about 1 percent to about 3 percent by weight of oxygen is added to the coal; and (c) activating the thus oxidized coal at a temperature between about 540° and 1,100° C. in a controlled oxygen atmosphere;

wherein the improvement comprises the step of contacting the coal starting material with a mineral acid in amount and for a time sufficient to result in an activated carbon produced by the remaining steps which has significantly higher Iodine and Carbontetrachloride Numbers, followed by the step of removing said acid from said coal, said steps being carried out prior to heating said coal in air.

4,014,818

HIGH SURFACE AREA CATALYST COMPOSITIONS

Johannes H. Tebben, Maastricht, and Cornelis A. M. Weterings, Stein, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 26, 1974, Ser. No. 527,285

Claims priority, application Netherlands, Nov. 28, 1973, 7316235

Int. Cl.² B01J *21/08*, *29/10*

U.S. Cl. 252—451 3 Claims

1. A supported nickel catalyst composition for hydrogenating oils, fats and fatty acids, comprising (a) silica as a supporting material and (b) free metallic nickel as the catalytically active material which is supported by said silica, wherein said silica is prepared by providing an alkali water glass; adding acid to said water glass to form a precipitate of silica and drying the silica by spray drying to form said supporting material; mixing said carrier with water and a water-soluble salt of said nickel; forming an insoluble salt of said nickel on said carrier, by increasing the concentration of hydroxyl ions in the solution; and reducing the nickel compound on said carrier to form the nickel metal catalyst on said carrier.

4,014,819

NICKEL CATALYST

Johannes H. Tebben, Maastricht, and Cornelis A. M. Weterings, Stein, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 26, 1974, Ser. No. 527,284

Claims priority, application Netherlands, Nov. 28, 1973, 7316234

Int. Cl.² B01J *29/10*

U.S. Cl. 252—459 10 Claims

1. A process for preparing a nickel catalyst which is precipitated on a silica carrier, wherein the specific nickel surface area is between 120 and 180 m^2/g, comprising measuring the pH of a mixture of a silica carrier in water; adding, with stirring, (1) a water soluble salt of nickel to the mixture and (2) urea to precipitate a composition comprising the insoluble nickel salt deposited on said carrier, at temperatures above 50° C.; and reducing said composition to form a metal catalyst deposited on said carrier; wherein the amount of urea added to the mixture of silica, water and water soluble nickel salt, satisfies the equation

$$U = f\sqrt{Ni} \qquad (1)$$

where:

U = urea concentration in grams per liter;

Ni = nickel ions concentration in grams per liter of water;

f = a factor varying between 75/pH and 175/pH, in which pH = the pH value of the suspension of the silica in the water.

4,014,820

METHOD OF MAKING A RANEY COPPER CATALYST AND THE CATALYST SO MADE

Jerry J. Svarz, La Grange; Louis A. Goretta, Naperville, both of Ill., and Virgil L. Seale, Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 458,435, April 5, 1976, Pat. No. 3,920,740, which is a continuation-in-part of Ser. No. 408,238, Oct. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 280,686, Aug. 14, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 569,308

Int. Cl.² B01J *23/00*, *23/72*, *25/02*; C07C *103/10*

U.S. Cl. 252—463 10 Claims

1. In a process for making a Raney copper catalyst which contains from about 2 to 45% by weight on a 100 weight percent total catalyst weight basis of aluminum, said catalyst having a relative activity of at least about 2.0 and having been prepared by contacting an aqueous medium containing dissolved therein alkali metal solution to a group of copper-/aluminum alloy particles, the improvement which comprises conducting such contacting by incrementally adding aqueous dissolved alkali metal hydroxide to said medium during said contacting over said time interval,

A. said aqueous alkali metal hydroxide solution containing from 0.5 to 40 weight percent dissolved alkali;
B. said group having an average particle size diameter in the range from about 0.002 to 0.5 inch;
C. said copper/aluminum alloy having initially a copper to aluminum weight ratio of from about 30:70 to 70:30;
D. said contacting being accomplished over a total time interval of from about 2 to 30 hours;
E. the addition rate of such alkali metal hydroxide contact-

ing being from about 0.01 to 7 moles of alkali metal hydroxide per mole of aluminum initially present in said alloy particles per hour;

F. the total quantity of alkali metal hydroxide so added being in the range of from about 0.5 to 20 moles of alkali metal hydroxide per mole of aluminum initially present in said alloy particles; and

G. the resulting aqueous medium produced in such contacting being maintained at a temperature in the range from about 32 to 180° F.

4,014,821

HEAVY CRUDE CONVERSION CATALYST

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 440,315, Feb. 7, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,301

Int. Cl.² B01J *23/84, 23/88*

U.S. Cl. 252—470 **11 Claims**

1. A catalyst having enhanced selectively suitable for the conversion and demetallization of feeds which contain large quantities of 1050° F.+ hydrocarbon materials comprising a composite of from about 5 to about 50 percent of a Group VIB metal, or compound thereof thermally decomposable to an oxide, or from about 1 to about 12 percent of a Group VIII metal, or compound thereof thermally decomposable to an oxide, or a composite which comprises an admixture of said Group VIB and Group VIII metals, or compounds thereof thermally decomposable to oxides, measured as oxides, and a porous inorganic oxide support, said catalyst comprising, when the catalyst is of size ranging 1/500 to 1/50 inch average particle size diameter, at least about 20 percent of its total pore volume of absolute diameter within the range of about 100A to about 200A; when the catalyst is of size ranging from about 1/50 inch up to 1/25 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 150A to about 250A; when the catalyst is of size ranging from about 1/25 inch to about 1/8 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 175A to about 275A; surface areas ranging at least about 200 m^2/g to about 600 m^2/g and pore volumes ranging from about 0.8 cc/g to about 3.0 cc/g.

4,014,822

SEMICONDUCTOR CERAMIC COMPOSITION

Nagao Fujikawa, Takatsuki, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 225,219, Feb. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 849,775, Aug. 13, 1969, abandoned. This application Apr. 26, 1974, Ser. No. 464,576

Claims priority, application Japan, Aug. 13, 1968, 43-57578

Int. Cl.² H01B *1/06*

U.S. Cl. 252—520 **21 Claims**

1. A ceramic composition for making a semiconductor, said composition consisting essentially of 83.95 to 98.65 mol% of a basic composition composed of 47.0 to 50.0 mol% of barium oxide and 50.0 to 53.0 mol% of titanium dioxide, 0.13 to 0.45 mol% of manganese oxide, 0.2 to 15 mol% of silicon dioxide and 0.23 to 1.65 mol% of one or more oxides selected from the group consisting of oxides of rare earth elements, bismuth and antimony, the content of said one or more oxides being 0.10 to 120 mol% greater than the content of manganese oxide.

4,014,823

π-TRICYCLENE-9-ALKANONE PERFUMES

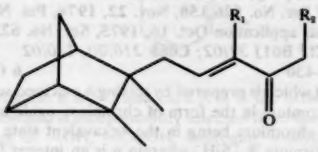
Braja Dulal Mookherjee, Holmdel; Venkatesh Kamath, Red Bank, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 556,862, March 10, 1975, Pat. No. 3,944,621. This application Jan. 5, 1976, Ser. No. 646,608

Int. Cl.² L11B *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A perfume composition comprising a tricyclic compound having the structure:



wherein R_1 and R_2 are each selected from the group consisting of hydrogen or methyl, at least one of R_1 or R_2 being hydrogen and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, other ketones, nitriles, esters, lactones and hydrocarbons.

4,014,824

TRIGLYCIDYL COMPOUNDS AND THEIR USE

Friedrich Stockinger, Therwil, and Friedrich Lohse, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

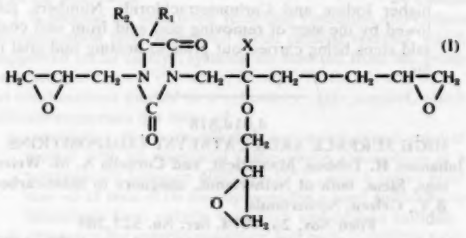
Division of Ser. No. 509,876, Sept. 27, 1974, Pat. No. 3,925,407. This application Sept. 22, 1975, Ser. No. 615,742

Claims priority, application Switzerland, Oct. 10, 1973, 14394/73

Int. Cl.² C08G *59/32*

U.S. Cl. 260—2 EC **6 Claims**

1. A curable mixture which is suitable for the manufacture of moldings or castings, comprising a triglycidyl compound of the formula I



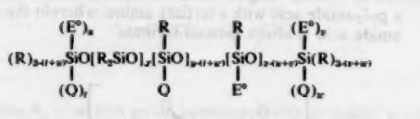
wherein X is hydrogen, or methyl, and R_1 and R_2 independently of one another each is hydrogen, alkyl, alkenyl, cycloalkyl or phenyl, which can be substituted, or wherein R_1 and R_2 together denote tetramethylene or pentamethylene; and a curing agent for epoxy resins.

4,014,825
TERTIARY ALCOHOL-BEARING ORGANOSILICONE POLYMERS

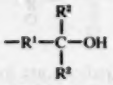
Bernard Kanner, West Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,840
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 AH **29 Claims**

1. A tertiary alcohol -substituted organosiloxane polymer having the average formula,



wherein: R is an alkyl radical having from one to ten carbon atoms; E° is hydrogen or a polyoxyalkylene block; Q is a tertiary alcohol group having the formula,



wherein R¹ represents a bivalent hydrocarbon radical selected from the calss consisting of alkylene radicals having from 2 to 8 carbon atoms, alkenylene radicals having from 2 to 8 carbon atoms and dialkylene ether radicals having from 4 to 10 carbon atoms; wherein each R² radical taken individually represents a monovalent hydrocarbon radical having from 1 to 10 carbon atoms or where taken together form a cycloaliphatic radical with the tertiary carbon atom of the

group, wherein *t*, *u*, *v*, *w*, the sum *t*+*u* and the sum *v*+*w* are independently zero or one, and each of the sums *t*+*w* and *u*+*v* is independently zero, one or two; *x* is zero or a positive number having an average value up to about 200; y has an average value from about 2 to about 100; and *z* has an average value from about 2 to about 30.

4,014,826
PROCESS FOR PREPARING REBONDED FOAM STRUCTURES

Malak E. Yunan, Boonton Township, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 452,568, March 19, 1974, Pat. No. 3,894,973. This application Mar. 13, 1975, Ser. No. 558,020
Int. Cl.² C08G *18/14*; C08J *9/22*
U.S. Cl. 260—2.5 AK **1 Claim**

1. The process of preparing a molded cushioning structure which comprises the steps of:

a. shredding or otherwise subdividing pneumacel batting into particles of substantially single-fiber dimensions,
b. mixing 1–50 parts by weight of the subdivided pneumacel batting of step (a) with 99–50 parts by weight of shredded elastomeric foam,
c. wetting the resulting mixture with from 5–50 parts by weight of elastomeric binder progenitor, and
d. curing the mixture resulting from steps (a) through (c) under conditions which result in conversion of the progenitor into an elastomeric adhesive, thereby bonding the mixture into a unitary elastomeric structure.

4,014,827
SUBSTRATE REINFORCED RUBBER STRUCTURE AND COMPOUND FOR FORMING SAME

David R. Hart, and Wade K. Cunningham, both of Birmingham, Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Mar. 10, 1975, Ser. No. 556,693
Int. Cl.² C08L *7/00*
U.S. Cl. 260—3 **6 Claims**

1. In a substrate reinforced rubber structure wherein the substrate is selected from the group consisting of cotton, rayon, nylon, fiberglass, steel and polyester, the improvement which comprises compounding the rubber with a methylene acceptor selected from the group consisting of resorcinol and precondensed resorcinolformaldehyde resin and as a donor, the reaction product of phenol and hexamethylenetetramine.

4,014,828
THERMOSETTABLE FRICTION PARTICLES FOR USE IN FRICTION ELEMENTS

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed June 23, 1975, Ser. No. 589,636
Int. Cl.² C08L *1/28*
U.S. Cl. 260—16 **26 Claims**

1. A process for preparing improved friction particles for use in friction element compositions wherein said particles are infusible with like friction particles and undergo no substantial softening at elevated temperatures, said process comprising the steps of polymerizing a cashew nut shell oil suspended in a liquid medium to form a resin and crosslinking the suspended resin in the presence of a suspension stabilizer.

4,014,829
FLAME RESISTANT FIBER BLENDS

Bennett Ray Baird, Camden, S.C., and Leander Adair Sherbeck, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1974, Ser. No. 519,355
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² C08L *1/02*
U.S. Cl. 260—17.2 **9 Claims**

1. A flame-resistant blend of textile fibers comprising (a) from about 20 to 40% by weight of a normally flammable textile fiber aesthetically suitable for wearing apparel and (b) from about 60 to 80% by weight of poly(metaphenylene isophthalamide) fiber containing distributed substantially throughout its whole interior a finely divided cross-linked reaction product of a tetrakis hydroxymethyl phosphonium compound selected from the group consisting of tetrakis hydroxymethyl phosphonium chloride, tetrakis hydroxymethyl phosphonium oxide and reactive derivatives thereof and a resin containing active hydrogen selected from the group of melamine formaldehyde, phenolformaldehyde and hexamethylol melamine, the phosphonium compound being present in an amount of from 5–20% by weight (unreacted basis) of the poly(metaphenylene isophthalamide) fiber.

4,014,830
ACRYLATE OR METHACRYLATE MODIFIED ALKYD RESINS AND EPOXY ESTERS

Robert D. Rumfield, Louisville, Ky., assignor to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed Oct. 30, 1975, Ser. No. 627,447
Int. Cl.² C08G *63/12*; C08K *5/01*
U.S. Cl. 260—22 CB **10 Claims**

1. A coating composition comprising an air-drying unsaturated fatty acid alkyd resin or epoxy ester blended with about 1 weight percent to about 10 weight percent, based on the total weight of the blend, of a polyacrylate or polymethacrylate ester of a polyol.

4,014,831

NOVEL IONIC POLYMER COMPOSITIONS

Jan Bock, Piscataway; Neville G. Thame, Edison, both of N.J., and Lowell Westerman, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 21, 1975, Ser. No. 579,496
Int. Cl.² C08F 8/42
U.S. Cl. 260—23 H 25 Claims

1. An improved process for forming a neutralized sulfonated polymer having a hydrocarbon backbone from an acid form of the sulfonated polymer having about 0.2 to about 25 mole percent SO_3H groups, wherein the improvement comprises the following steps:

a. adding a first neutralizing agent to said acid form of said sulfonated polymer to neutralize at least about 50% of said SO_3H groups, said first neutralizing agent being selected from the group consisting essentially of Groups I-A, II-A, II-B, III-A, IV-A or ammonium derivatives of fatty acids, to form a mixture of a partially neutralized sulfonated polymer and said fatty acid formed from said derivative of said fatty acid; and

b. adding a second neutralizing agent to form a metallic salt of said fatty acid, said metallic salt of said fatty acid having a higher melting point than said fatty acid and further neutralizing said SO_3H groups of said partially neutralized sulfonated polymer to at least about 95%, said second neutralizing agent being selected from about consisting essentially of hydroxides, lower alkoxides, and lower alkonoates of Group I-A, II-A and II-B metals, at least 25% of the fatty acid being converted into the higher melting salt.

4,014,832

HEAT RESISTANT RESIN SOLUTION AND METHOD FOR PREPARATION THEREOF

Yasuhiro Suzuki; Toshihide Okamoto; Yuzuru Noda, and Makoto Kojima, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Apr. 18, 1975, Ser. No. 569,427
Claims priority, application Japan, May 1, 1974, 49-48277
Int. Cl.² C08G 51/24
U.S. Cl. 260—29.2 N 13 Claims

1. A method for the preparation of heat resistant resin solutions comprising preparing a polymer having a residual acid value of about 5 to 40% by heat reacting 1,2,3,4-butanetetracarboxylic acid, an aromatic tricarboxylic acid anhydride and a diamine in the presence of a polyhydric alcohol, and dissolving the polymer in aqueous ammonia and at least one solvent selected from the group consisting of monohydric alcohols, polyhydric alcohols, polyhydric alcohol derivatives, ketones, ethers and esters.

4,014,833

AQUEOUS PRINTING INK WITH POLYETHYLENE OXIDE

Augustus L. Story, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1975, Ser. No. 635,819
Int. Cl.² C09D 11/10
U.S. Cl. 260—29.2 EP 8 Claims

1. A method for improving the transfer characteristics of an aqueous printing ink which comprises adding to the ink polyethylene oxide having an average molecular weight of from 100,000 to 350,000.

4,014,834

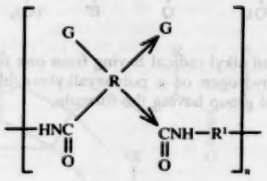
AQUEOUS SOLUTIONS OF POLYAMIDE ACIDS WHICH CAN BE PRECURSORS OF POLYIMIDE POLYMERS

Thomas Patrick Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1975, Ser. No. 546,998
Int. Cl.² C08J 3/06; C08L 79/08
U.S. Cl. 260—29.2 N 11 Claims

1. A composition consisting essentially of an aqueous solution of

A. 20 to 70% by weight, based on the solution, of a salt of a polyamide acid with a tertiary amine, wherein the polyamide acid is of the general formula



wherein one or both G radicals are hydrogen or a carboxyl; atoms and groups wherein → denotes isomerism so that in any recurring unit within the polymeric structure the groups to which the arrows point may exist as shown or in an interchanged position; wherein R is an organic tetravalent radical containing at least two carbon atoms and no more than two carbonyl groups of each polyamide acid unit are attached to any one carbon atom; wherein R^1 is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units are attached to separate carbon atoms of said divalent radical; and wherein n is an integer sufficient to provide a polyamide acid having an inherent viscosity of 0.1–5.0, as measured as a 0.5% solution in N,N-dimethylacetamide at 30° C., and wherein said tertiary amine is present in at least a stoichiometrically equivalent amount to the free carboxylic acid groups in said polyamide acid;

B. 5 to 25% by weight, based on the solution, of a viscosity reducing agent which is miscible with water and has a solubility parameter range of 10–20.4 wherein said solubility parameter has a dispersion component in the range of 7.0–10.0, a polar component in the range of 2.0–11.0, and a hydrogen bonding component in the range of 7.0–14.0;

C. 5 to 35% by weight, based on the solution, of a coalescing agent, wherein said coalescing agent is at least one member selected from the group consisting of N-methylpyrrolidone, dimethyl formamide, dimethyl acetamide, dimethyl sulfoxide, cresylic acid, sulfolane, formamide;

and wherein water comprises 30–80% by weight of the solution.

4,014,835

COMPOSITION COMPRISING A BLEND OF A RESORCINOL-ALDEHYDE RESIN; AN ELASTOMER AND AN ORGANO SILICON COUPLING SYSTEM

Frank Paul McCombs, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

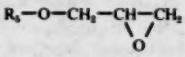
Division of Ser. No. 354,980, April 27, 1973, Pat. No. 3,900,661. This application Apr. 14, 1975, Ser. No. 567,660
Int. Cl.² C08G 51/24
U.S. Cl. 260—29.3 26 Claims

1. A composition for use in the treatment of glass fibers comprising (A) an aqueous dispersion having a solids content comprising 2 to 10 parts by weight of a resorcinol-aldehyde resin and 20 to 100 parts by weight of at least one elastomer and (B) from 0.1 to 25% of total solids of a combination of organo silicon compounds comprising (1) 1 to 30% by weight of an amino-substituted organo silane or its hydrolysis product

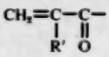
and (2) 99 to 70% by weight of an organo silicon compound containing at least one beta-haloalkoxy group in the form of the reaction product of (a) a halosilane

$$(R_3)_e SiX_{4-e}$$

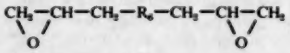
wherein R_3 is an organic group, X is halogen and *e* is 0 or an integer from 1 to 2, (b) an alkylene oxide containing 1 to 6 carbon atoms and (c) an epoxide selected from the group consisting of a monoepoxide of the formula



wherein R_5 is an aryl group substituted with an amino group, a halogen group, an alkyl group containing 1 to 20 carbon atoms and substituted derivatives thereof, an alkenyl group containing 2 to 8 carbon atoms, a



group wherein R′ is hydrogen or methyl, a diepoxide of the formula



wherein R_6 is a divalent organic radical group and a cyclohexane diepoxide; with (b) and (c) being in the ratio of from 1 to 3 epoxide equivalents of (b) to from 0.5 to 3 epoxide equivalents of (c).

4,014,836

FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

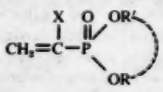
Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. Nos. 49,204, June 23, 1970, Pat. No. 3,725,509, and Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,086

Int. Cl.² C08L *43/02, 27/00*

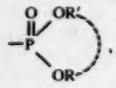
U.S. Cl. 260—29.6 TA **10 Claims**

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

1. from about 10 to 98% by weight of a vinyl or vinylidine halide;
2. from about 1% to 89% by weight of at least one bis(hydrocarbyl)vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl and



wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

3. from about 1 to 45% by weight of at least one third comonomer selected from the vinyl esters of carboxylic acids.

4,014,837

FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

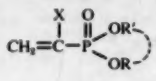
Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, and a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,228

Int. Cl.² C08L *43/02, 27/00*

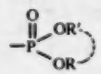
U.S. Cl. 260—29.6 TA **8 Claims**

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

1. from about 10 to 98% by weight of a vinyl or vinylidene halide;
2. from about 1% to 89% by weight of at least one bis(hydrocarbyl)vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl and



wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

3. from about 1% to 45% by weight of at least one third comonomer selected from the ethylenically unsaturated dicarboxylic acids, anhydrides and the C_1–C_{20} mono- and dialkyl esters thereof.

4,014,838

FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

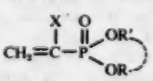
Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, which is a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,122

Int. Cl.² C08L *43/02, 27/00*

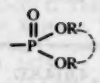
U.S. Cl. 260—29.6 TA **9 Claims**

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

1. from about 10 to 98% by weight of a vinyl or vinylidene halide;
2. from about 1% to 89% by weight of at least one bis (hydrocarbyl) vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1-C_{18} alkyl and



wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

3. from about 1% to 45% by weight of at least one third comonomer selected from the C_1-C_{20} alkyl vinyl ethers.

4,014,839

FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, and a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,121

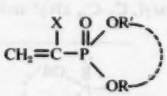
Int. Cl.² C08L *43/02, 27/00*

U.S. Cl. 260—29.6 TA **8 Claims**

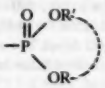
1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

1. from about 10 to 98% by weight of a vinyl or vinylidene halide;

2. from about 1% to 89% by weight of at least one bis (hydrocarbyl) vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1-C_{18} alkyl and



wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

3. from about 1% to 45% by weight of at least one third comonomer selected from the alpha olefins.

4,014,840

NON-DISTRESSING ACCELERATED HEAT CURE OF PORTLAND CEMENT CONCRETE SYSTEMS

Gale L. Emig, Midland; Robert H. Anspaugh, Bay City, and R. Douglas Eash, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 12, 1974, Ser. No. 478,480

Int. Cl.² C08L *27/08*

U.S. Cl. 260—29.6 S **2 Claims**

1. A process for non-distressing accelerated heat cure of portland cement concrete systems said process consisting of the sequential steps of (1) admixing portland cement concrete with a vinylidene chloride polymer latex said latex being present in an amount sufficient to provide from about 5 to about 20 percent by weight of latex solids based on the weight of portland cement in said portland cement concrete and wherein said vinylidene chloride polymer is composed of about 75 parts by weight of vinylidene chloride, about 5 parts by weight of ethyl acrylate, about 2 parts by weight of methyl methacrylate and about 20 parts by weight of vinyl chloride, then (2) heating said admixture to temperatures of from at least about 100° F to about 250° F under less than about 80 percent relative humidity for a period of at least about 4 hours.

4,014,841

AEROSOL LATEX PAINT CONTAINING CATIONIC SURFACTANTS

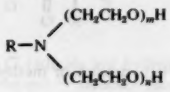
Bernard Taub, Williamsville, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 24, 1975, Ser. No. 571,126

Int. Cl.² C08L *31/04*

U.S. Cl. 260—29.6 MN **11 Claims**

1. An aerosol latex paint composition comprising an emulsion of a pigmented aqueous dispersion of a waterinsoluble vinyl acetate-acrylic copolymer resin in a liquid propellant containing a cationic surfactant having an HLB value of between 5 and 10, wherein the liquid propellant comprises 30 to 70 weight percent of the composition and is a hydrocarbon having 3 to 4 carbon atoms, a halogenated hydrocarbon having 1 to 4 carbon atoms, or mixtures thereof, and wherein the cationic surfactant has the formula



wherein R is a straight chain alkyl, or a straight or branched chain alkyl or aralkyl, containing 7 to 24 carbon atoms, said R can contain a nitrogen atom as an amine linkage and up to two oxygen atoms as ester or ether linkages or as -OH groups, and m and n are integers of 0 to 4, with the sum of m and n equal to at least 1 and not greater than 4.

4,014,842

VINYL CHLORIDE RESIN COMPOSITIONS

Takumi Kosugi; Shigeki Yasunaga, both of Kobe; Yutaka Tanaka, Akashi, and Yoshihiko Hashimoto, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 363,478, May 24, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,766

Int. Cl.² C08L *27/06, 51/00*

U.S. Cl. 260—29.6 RB **8 Claims**

1. A vinyl chloride resin composition consisting essentially of a blend of 30 to 97 parts by weight of a vinyl chloride honro polymer or a copolymer derived from 70% or more vinyl chloride and 30% or less one or more monomers copolymerizable therewith and 3 to 70 parts by weight of a graft polymer prepared by graft polymerizing 80 to 20 parts by weight of a monomer mixture of 10 to 100% by weight alkyl methacrylate selected from the group consisting of methyl methacrylate, ethyl methacrylate, propyl methacrylate, isopropyl methacrylate, isobutyl methacrylate, sec-butyl methacrylate, tert-butyl methacrylate, and mixtures thereof; 0 to 80% by weight of a vinyl aromatic compound selected from the group consisting of styrene, vinyl toluene, alpha substituted styrene, benzene-(substituted) styrene and its derivatives, vinyl carbazole, vinylbiphenyl and mixtures thereof; and 0 to 35% by weight unsaturate nitrile selected from the group consisting of acrylonitrile and methacrylonitrile; onto a substrate polymer of alkyl acrylate selected from the group consisting of ethyl acrylate, propyl acrylate, n- butyl acrylate, isobutyl acrylate, pentyl acrylate, hexyl acrylate, n-octyl acrylate, 2-ethyl-hexyl acrylate and mixtures thereof and an allyl ester of vinyl or vinylidene unsaturated alpha-carboxylic acid selected from the group consisting of allyl acrylate, allyl methacrylate, monoallyl itaconate, diallyl itaconate and mixtures thereof, said substrate polymer being in an aqueous dispersion and said allyl ester being in an amount of 0.1 to 8% by weight of said substrate polymer and the particles size of said dispersion being between 0.05 to 0.2 microns and the gel content being at least 50%.

4,014,843
LATEX COMPOSITIONS

Valentino George Xanthopoulo, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 367,504, June 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 141,433, May 7, 1971, abandoned. This application Apr. 30, 1975, Ser. No. 573,114

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² C08L *9/00, 9/04, 9/08, 25/14*

U.S. Cl. 260—29.7 T **9 Claims**

1. A process of producing a high solids latex foamable to a stable froth which comprises polymerizing 100 parts by weight of a monomer mixture of (a) 30–100% by weight of an aliphatic conjugated C_4-C_8 diolefin and (b) 0–70% by weight of at least one copolymerizable compound, said monomer mixture being emulsified in less than 140 parts by weight of an aqueous phase containing less than 6 parts by weight of (A) a polymerization promoting emulsifier system consisting of (1) an alkali metal salt of an alkyl sulfate, alkoxyalkyl sulfate or alkoxyalkyl phosphate having a critical micelle concentration from about 0.002% to about 0.15% or (2) an alkali metal salt of sulfosuccinic acid or an amine derivative of sulfosuccinic acid having a hydrocarbyl substituent attached to an oxygen atom or a nitrogen atom, or a partial alkali metal salt of N-alkyl beta imino dicarboxylic acid, said salt (2) having a critical micelle concentration from about 0.01% to about 1.0% and (B) from about 0.001 to less than 0.1 part by weight of a water dispersible agglomerating system comprising the reaction product of a polyoxyalkylene glycol having a molecular weight of at least 5,000 with the polyepoxide obtained by reacting epichlorohydrin with a polyhydric phenol, said reaction product having a molecular weight of about 15,000 – 20,000, said polymerization being carried out to at least 65% conversion to form a stable fluid latex and concentrating said latex to a solids level of at least 55%.

4,014,844
PROCESS FOR GRAFTING POLYMERS ON CARBON BLACK THROUGH FREE RADICAL MECHANISM

Alain Vidal; Gerard Riess, and Jean-Baptiste Donnet, all of Mulhouse, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 157,672, June 28, 1971, abandoned. This application Apr. 2, 1975, Ser. No. 564,477

Claims priority, application France, June 26, 1970, 70.23691

Int. Cl.² C08K *3/04*

U.S. Cl. 260—31.2 R **10 Claims**

1. A process for grafting polymers on carbon black through a transfer reaction free radical mechanism which comprises (1) forming a reaction mixture consisting of carbon black and at least one polymer containing a tertiary hydrogen atom, (2) degassing said mixture under vacuum at approximately room temperature, (3) adding at least one substance that is a solvent for said polymer to said degassed mixture, under vacuum, to form a solution of the said polymer containing the carbon black and (4) heating said solution to a temperature of at least 50° C at which said reaction takes place and continuing the reaction until the desired carbon black bearing polymer graft is obtained.

4,014,845
FUGITIVE VEHICLE SYSTEM

John D. Grier, Temperance, and Lynn J. Taylor, Haslett, both of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 23, 1971, Ser. No. 174,197

Int. Cl.² C08K *5/01, 5/03, 5/12*

U.S. Cl. 260—31.8 R **6 Claims**

1. As a composition of matter, a fugitive vehicle system comprising at least two organic components, at least one component being a solid polymeric material at ambient temperature, said polymeric material being a copolymer, terpolymer, or quadpolymer of oxygen and at least one monomer of alkyl methacrylate with the alkyl containing 1 to 6 carbon atoms and being capable of pyrolyzing in a non-oxygen containing environment at an elevated temperature of about 250° C to about 450° C without leaving a carbonaceous residue, and at least one other component being a solvent for the polymer material, said solvent being selected from the group consisting of dimethyl phthalate; diethyl phthalate; di-n-butyl phthalate; di-n-butyl succinate; dimethyl sebacate; dibenzyl ether; butyl benzoate; acetyl triethyl citrate; glyceryl triacetate; beta-ethoxy ethyl benzoate; isoamyl benzoate; benzyl benzoate; isobutyl salicylate; isoamyl salicylate; benzyl salicylate; ethyl laurate; butyl oleate; ethyl myristate; butyl benzyl phthalate; dimethyl suberate; diethyl sebacate; diethyl azelate; di-n-butyl adipate; diisobutyl adipate; dibutyl sebacate; dibutyl tartrate; glyceryl tributyrate; diethyl isophalate; butyl palmitate; dodecylbenzene; tetradecylbenzene; pentaethylbenzene; diphenylmethane; 1,1-diphenylethane; 1-chloronaphthalene; 1-bromonaphthalene; dimethylnapthalene; 1-methoxy naphthalene; an n-alkane containing 14 to 20 carbon atoms; diphenyl ether; bis(alpha-methylbenzyl) ether; tetraethylene glycol dimethyl ether; 2-benzyloxyethanol; phenyl n-hexyl carbinol; triethylene glycol; 1,5-pentanediol; hexanophenone; 1-naphthyl methyl ketone; p-n-pentylphenol; N-cyclohexyl-2-pyrrolidone, glutaronitrile; and p-methoxyphenylacetonitrile; and having a boiling or decomposition temperature below the pyrolyzing temperature of the polymeric material, said temperature being in the range of about 100° C to about 400° C.

4,014,846
LOW-VISCOUS, STABLE POLYMER DISPERSIONS AND POLYURETHANES PREPARED THEREFROM

Gerhard G. Ramlow, East Windsor, N.J.; Louis C. Pizzini, Trenton, Mich.; John T. Patton, Jr., Wyandotte, Mich., and John R. Murphy, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Apr. 29, 1974, Ser. No. 465,072

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.² C08G *18/14, 18/62*

U.S. Cl. 260—33.2 R **28 Claims**

1. A low-viscous, stable polymer dispersion prepared by blending:

a. from 45 to 95 weight percent of a liquid polyol having a hydroxyl equivalent weight of from 500 to 10,000 with

b. from 55 to 5 weight percent of a hydroxycontaining finely-divided solid polymer obtained by polymerizing in the presence of a free radical catalyst and an organic solvent:

1. from about 55% to 95% by weight of an ethylenically unsaturated monomer or mixture of monomers and

2. from about 45% to 5% by weight of a hydroxy-terminated organic compound having from one to eight hydroxyl groups, a hydroxyl equivalent weight of from 500 to 10,000 and containing a polymerizable carbon-to-carbon double bond, said weight percents being based on the total weight of (1) and (2).

4,014,847

IONIC POLYMER PLASTICIZED WITH PREFERENTIAL PLASTICIZERS

Robert D. Lundberg, Somerville; Henry S. Makowski, Scotch Plains, both of N.J., and Lowell Westerman, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 11, 1974, Ser. No. 487,467

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C08K *5/05, 5/20, 5/43, 5/49*

U.S. Cl. 260—33.4 R 18 Claims

1. A composition of matter comprising an ionically crosslinked polymer in combination with from about 0.2 to 50 parts per hundred parts ionically crosslinked polymer of a preferential plasticizer wherein said plasticizer is a normally liquid, non-volatile compound having a solubility parameter of at least nine, a boiling point of at least 150°C, and containing functional groups exhibiting a bond moment of at least 0.6 Debye, wherein the ionically crosslinked polymer is a sulfonated polymer.

4,014,848

NON-HARDENING HIGH MOLECULAR WEIGHT TRANS-POLYPENTENAMERS

Friedrich Haas, Cologne-Buchheim; Karl Nützel, Opladen, and Hans-Joachim Jahn, Cologne-Flittard, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

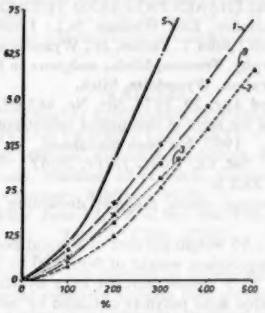
Continuation of Ser. No. 330,641, Feb. 8, 1973, abandoned, which is a continuation of Ser. No. 164,137, July 19, 1971, abandoned, which is a continuation of Ser. No. 813,688, April 4, 1969, abandoned. This application May 17, 1974, Ser. No. 470,945

Claims priority, application Germany, Apr. 11, 1968, 1769149

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C08F *32/04;* C08K *5/01*

U.S. Cl. 260—33.6 AQ 6 Claims



1. A composition of matter consisting essentially of (a) a high molecular weight polypentenamer having more than 50% of its double bonds in the trans-configuration obtained by ring-opening polymerization of cyclopentene and having a Mooney viscosity ML 4' (100°C.) of from 50 to 200 and (b) from 20 to 100 parts by weight of a plasticizer per 100 parts by weight of said polypentenamer, said plasticizer being a paraffinic, naphthenic or aromatic hydrocarbon having a molecular weight of from 200 to 1500.

4,014,849

SELF-EXTINGUISHING REINFORCED POLYCARBONATE MOLDING COMPOSITIONS

Peter Horn, Ludwigshafen, and Cai von Rumohr, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 4, 1974, Ser. No. 520,878

Claims priority, application Germany, Nov. 5, 1973, 2355211

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² C08L *69/00*

U.S. Cl. 260—37 PC 7 Claims

1. Self-extinguishing reinforced organic polycarbonate molding compositions comprising:

a. an organic polycarbonate;

b. from 0.5 to 15% by weight of particulate red phosphorus based on the weight of the polycarbonate, said red phosphorus having an average particle diameter of from 0.001 to 0.5 mm; and

c. from 5 to 50% by weight of a reinforcing agent based on the weight of the polycarbonate.

4,014,850

FRICTION ELEMENTS CONTAINING NOVEL FRICTION PARTICLES

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed June 23, 1975, Ser. No. 589,637

Int. Cl.² C08L *61/06*

U.S. Cl. 260—38 15 Claims

1. In a friction element which comprises a filamentous friction material, a thermosettable resin friction binder, and a friction particle, the improvement wherein the friction particle is a particulate product prepared by polymerizing a cashew nut shell oil suspended in a liquid medium to form a resin and crosslinking the suspended resin with a crosslinking agent in the presence of a suspension stabilizer.

4,014,851

POLYOLEFIN-FILLED VINYLORANOPOLYSILOXANE COMPOSITION AND METHOD OF PREPARATION

Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,009

Int. Cl.² C08K *3/00*

U.S. Cl. 260—42.26 25 Claims

1. A stable polymer-filled vinylorganopolysiloxane dispersion comprising two phases:

i. a continuous phase comprising an essentially ungrafted vinylorganopolysiloxane fluid and intimately dispersed therein

ii. a discontinuous phase comprising finely divided solid particles of an ungrafted polymer prepared from an organic monomer having aliphatic unsaturation or a mixture of such monomers polymerized in the presence of said vinylorganopolysiloxane.

4,014,852

COVULCANIZATION OF CONJUGATED DIENE-CONTAINING BUTYL WITH HALOBUTYL AND BUTYL RUBBER

Albert M. Gessler, Cranford, and Francis P. Baldwin, Summit, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 393,349, Aug. 31, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 562,827

Int. Cl.² C08K *3/04*

U.S. Cl. 260—42.35 15 Claims

1. A tire inner liner which comprises a curable blend of from 5 to 95 weight percent (wt.%) conjugated diene-containing butyl rubber and from 95 to 5 wt.% of a rubber selected

from the group consisting of butyl or halogenated butyl rubber, carbon black, oil, and a vulcanization system.

4,014,853

STABILIZED POLYMERIC COMPOSITION AND PRODUCT USING SAME

Ray Lawson Hartless, Lopatcong Township, Warren County, and Anthony Marion Trozzolo, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1974, Ser. No. 500,959

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C08K 5/00

U.S. Cl. 260—45.8 NZ **7 Claims**

1. Article including at least one metallic portion in intimate contact with a plastic portion, said metallic portion including at least one element which accelerates the oxidative degradation of at least a component of the said plastic portion, the said plastic portion including a polymeric composition which is at least 90 percent by weight polymer, exclusive of filler, the said plastic portion containing a metal deactivator to lessen the acceleration of oxidative degradation due to the said metallic portion; characterized in that the said metal deactivator may be produced as the condensation product of two reactants: oxalyl dihydrazide and a furyl carbonyl compound selected from the group consisting of substituted and unsubstituted furyl aldehydes and furyl ketones.

4,014,854

LINEAR COPOLYMERS OF GLYCIDOL

Violete L. Stevens; Arthur R. Sexton, and Frederick P. Corson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1974, Ser. No. 444,078

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08G 23/22

U.S. Cl. 260—47 EQ **8 Claims**

1. Compounds of the formula

$$R\,[(R'O)_mX]_n$$

wherein R is the residue left by the removal of n active hydrogen atoms from an initiator compound, RH_n; each R′ independently is an alkylene radical selected from the group consisting of ethylene, trimethylene, tetramethylene, 1,2-butylene, 2,2-bis(halomethyl)-1,3-propylene, and groups of the formula

$$-CH_2CHCH_2A$$

each A independently is H, Cl, Br, or OX; each X independently is H or the acyl radical of a carboxylic acid with the proviso that at least one R′ is 3-hydroxy-1,2-propylene and at least one is a group of the formula

$$-CH_2CHCH_2OX$$

wherein X is the acyl radical of an α,β-unsaturated carboxylic acid; and m and n are integers such that the total number of R′O groups is at least 2, n being 1–8.

4,014,855

POLYHALOGENATED AROMATIC COMPOUNDS AND POLYMERS THEREOF

Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

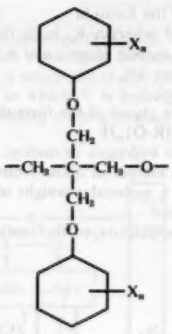
Filed Nov. 14, 1974, Ser. No. 523,670

Int. Cl.² C08G 63/66

U.S. Cl. 260—47 C **12 Claims**

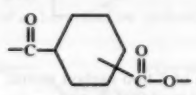
1. A copolyester of (a) and (b) units, and optionally (c) units wherein

a. represents units of the formula



wherein each X is halogen selected from Br and Cl and each *n* is 3 to 5;

b. represents diacid units of the formula



and

c. represents —RO— wherein R is a lower aliphatic group containing from 2 to 10 carbon atoms,

provided that the copolyester contains at least about five percent of halogen which is contained in the (a) units.

4,014,856

LIQUID ELECTROPHOTOGRAPHIC DEVELOPERS

Yvan Karel Gilliams, Berchem; Jozef Leonard Van Engeland, St. Katelijne-Waver, and Noel Jozef De Volder, Edegem, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed July 5, 1973, Ser. No. 376,749

Claims priority, application United Kingdom, July 12, 1972, 32656/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² G03G 9/00

U.S. Cl. 252—62.1 L **14 Claims**

1. A liquid toner composition for the development of electrostatic charge patterns comprising an electrically insulating carrier liquid having a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant below 3, and a pigment or colouring agent suspended in the said carrier liquid, wherein the said liquid composition comprises dissolved in the carrier liquid(1) a bivalent or trivalent metal salt of an oxyacid derived from phosphorus containing at least one organic residue and (2) one or more members selected from the group consisting of amines, polyurethans and alkylated polymers of a heterocyclic N-vinyl monomer.

4,014,857

FLUORINATED OILY SOIL RELEASE AGENTS

Ronald W. Schmoyer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 6, 1974, Ser. No. 530,437

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.[2] C08G *9/36*

U.S. Cl. 260—67.6 R 4 Claims

1. An adduct prepared by condensing, in the presence of an acid catalyst and under temperature and pressure conditions that result in the removal of alcohol formed by the condensation of

A. an alcohol of the formula

1 $R_f(CH_2)_nOH$ wherein R_f is perfluoroalkyl of from 4 through 16 carbon atoms, and n is an integer from 1 through about 16;

B. ethylene glycol;

C. a polyalkylene glycol of the formula

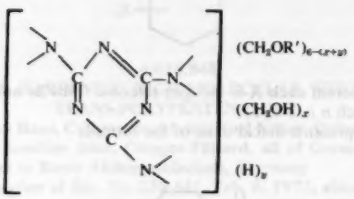
2 $HO(CH_2\text{-}CHR\text{-}O)_mH$

wherein R is hydrogen or methyl;

and m is an integer of about from 4 to 450;

and having a molecular weight of about from 200 to 20,000; and

D. at least one poly(alkoxymethyl)melamine of the formula



wherein

R' is alkyl of 1 to 5 carbon atoms;

x has a value of 0 to 2; and

y has a value of 0 to 3 with the limitation that $x + y$ cannot exceed a value of 3; **wherein the equivalents ratio of A to B + C is about from** 1/20 to 20/1, the equivalents ratio of A + B + C to D is about from 0.5/1 to 1.5/1, and the equivalents ratio of B to C is about from 10/1 to 1/10.

4,014,858

POLYBUTYLENE TEREPHTHALATE

Gary R. Chipman, Naperville; Michael G. Henk, Wheaton; Jacob A. De Boer, Western Springs, and Eli W. Blaha, Wheaton, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 12, 1975, Ser. No. 576,478

Int. Cl.[2] C08G *63/14*

U.S. Cl. 260—75 R 20 Claims

1. The process of carrying out a first stage polyesterification which comprises reacting a polyhydric alcohol and a polycarboxylic acid compound in a concentration of 1.1 to 4 hydroxyl equivalents per carboxyl equivalent under polyesterification conditions at about 180° to 250° C. in the presence of a catalytic concentration of a tetravalent tin compound having one organo to tin linkage, per tin atom wherein 1,4-butane diol provides from 75 to 100 equivalent percent of the hydroxyl groups of the polyhydric alcohol compound, a terephthalic acid compound provides from 75 to 100 equivalent percent of the carboxyl groups of the polycarboxylic acid compound and at least 50 percent of the carboxyl equivalents are provided by terephthalic acid.

4,014,859

PRODUCTION OF POLYETHYLENE

Richard Roy Cooper, St. Albans, and Kenneth Stephenson Whiteley, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 29, 1974, Ser. No. 456,384

Claims priority, application United Kingdom, Mar. 29, 1973, 15156/73

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.[2] C08F *10/02, 10/08, 110/02, 210/08*

U.S. Cl. 526—65 15 Claims

1. A process for the polymerization or copolymerization of ethylene, in at least two reaction zones comprising:

a. passing a product mixture of ethylene, an ethylene polymer, and at least one further component selected from the group consisting of comonomer, chain transfer agent and inert diluent at a pressure in the range 300 to 3000 kgm/cm^2 from a reaction zone into a separator maintained at a pressure below the pressure of the product mixture, effecting separation into a gas phase and a liquid phase, said liquid phase comprising the ethylene polymer and dissolved gas;

b. passing said liquid phase to a low pressure hopper maintained at a pressure below that of said separator and removing the major portion of the dissolved gas from the polymer and low pressure hopper;

c. compressing the gas removed from said low pressure hopper to an intermediate pressure;

d. providing a stream of fresh ethylene and passing it to a compressor;

e. compressing the gas stream of fresh ethylene and passing it to the first zone of the polymerization reactor,

f. optionally mixing the gas phase from the separator with either a chain transfer agent, a stream of fresh ethylene or both which stream of fresh ethylene optionally contains comonomer, inert diluent or both,

g. passing the resulting gas phase to a compressor and compressing this gas phase, and passing this gas phase to at least one zone, other than the first zone of the polymerization reactor;

h. mixing the compressed gas from the low pressure hopper with either

1. the stream of fresh ethylene which is compressed and passed to the first stage of the polymerization reactor, or

2. the gas phase from the separator which is compressed and passed to the polymerization reactor; and

i. introducing a polymerization catalyst into at least the first zone of the polymerization reactor.

4,014,860

PLASMINOSTREPTIN (ENZYME INHIBITOR) AND METHOD FOR PRODUCING IT FROM STREPTOMYCES

Atsushi Kakinuma, Kyoto; Hiromu Sugino, Toyonaka; Norihiko Moriya, Ikeda, and Masao Isono, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1973, Ser. No. 328,077

Claims priority, application Japan, Feb. 8, 1972, 47-14132

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.[2] C12D *13/06;* C07G *7/00*

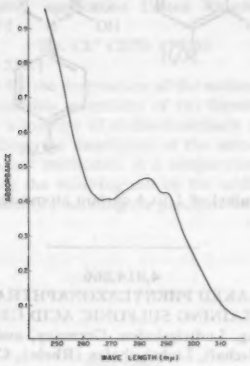
U.S. Cl. 260—112 R 4 Claims

1. Plasminostreptin, capable of inhibiting the proteolytic activity of plasmin and trypsin, characterized by the following properties:

a. a molecular weight of 26,000 ± 2,000 as determined in 0.1 M sodium chloride by Archibald's ultracentrifugal method, and 25,000 ± 2,000 as determined in 0.05 M Tris-HCl buffer-0.1 M potassium chloride by Andrews' gel filtration method,

b. sedimentation constant (S_{20}, w), by ultracentrifugation, of 2.5 ± 0.3 S in 0.1 M sodium chloride and 1.2 ± 0.3 S in 4 M guanidine hydrochloride,

c. elemental analysis indicating C, 51.48 ± 2.0%; H, 6.96 ± 0.5%; N, 16.63 ± 1.0%; and S, 1.84 ± 0.5%,
d. specific rotation $[\alpha]_D^{23}$ of about −90° (C=1, in a weakly alkaline solution),
e. isoelectric point of about 6.3 as determined by the isoelectric focussing method,
f. 0.05% solution thereof in 0.1 M sodium chloride gives a maximum absorption at 283 mμ, a minimum absorption at 267 mμ and a shoulder at 288 to 291 mμ,
g. significant infrared absorption bands at wave numbers (cm^{-1}) 3280, 3070, 2960, 1670, 1640, 1530, 1400, 1240 and 1160.
h. contains alanine, valine, glycine, threonine, aspartic acid, glutamic acid, leucine, phenylalanine, arginine, proline, serine, cystine or cysteine, lysine, tyrosine, histidine, methionine and tryptophan, and does not contain isoleucine,



i. positive to hypochlorite reagent and Folin-Ciocalteu reagent,
j. soluble in water and aqueous ammonia; slightly soluble in pyridine; sparingly soluble in glacial acetic acid, alcohols, acetone, chloroform, ether and hexane; substantially completely precipitated by ammonium sulfate at 60% saturation and solubility dropping in the neighborhood of pH 6,
k. more than 50% of the initial activity thereof remains intact after treatment for 30 minutes at pH 4–9 and 100°C, and
l. dialytic behavior indicating substantially all the activity thereof remains in the internal solution, when dissolved in water having a pH of 8.0 to a concentration of 10 mg./ml and dialyzed in a cellophane bag against ten times as much volume of water having a pH of 8.0 to 4°C for 24 hours.

4,014,861

PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rolf Geiger, Frankfurt am Main, and Rainer Obermeier, Hattersheim am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

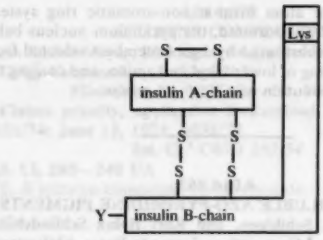
Filed June 10, 1975, Ser. No. 585,604

Claims priority, application Germany, June 12, 1974, 2428412

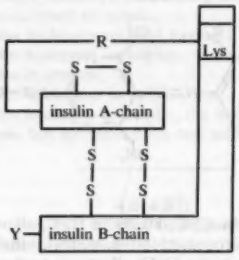
Int. Cl.² C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112.7 **2 Claims**

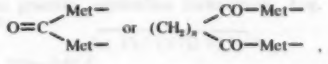
1. A method for making an insulin compound of the formula



and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, and in which Y is hydrogen or acyl, which method comprises treating a compound of the formula



or an analog thereof as hereinbefore defined, wherein R is



Met is methionine, *n* is an integer from 1 to 4, and one —(CH₂)— may be replaced by oxygen, with cyano bromide in an acid medium.

4,014,862

PRODUCTION OF HARDENED GELATIN LAYERS BY THE ADDITION OF QUATERNARY CARBAMOYL PYRIDINIUM COMPOUNDS

John Douglas Ballantine, and Norman Alfred Smith, both of Ilford, England, assignors to Ilford Limited, Ilford, England

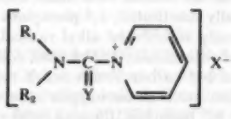
Filed July 6, 1973, Ser. No. 377,139

Claims priority, application United Kingdom, July 12, 1972, 32491/72

Int. Cl.² C09H *5/00*

U.S. Cl. 260—117 **5 Claims**

1. A method of producing a hardened gelatin layer which comprises treating an aqueous gelatin solution with an aqueous solution of a hardening agent of the formula



(I)

wherein X^- is a perchlorate or fluoroborate anion, Y is an oxygen atom, R_1 and R_2 are each a lower alkyl or aryl group which is optionally substituted, or R_1 and R_2 taken together

with the nitrogen atom form a non-aromatic ring system, which is optionally substituted, the pyridinium nucleus being unsubstituted or substituted by 1 to 4 members selected from the group consisting of lower alkyl and amino, and coating the resultant gelatin solution as a layer on a base.

4,014,863

WATER-INSOLUBLE AZO-PYRIMIDINE PIGMENTS

Günter Stephan, Schildgen, and Karl Heinz Schündehütte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

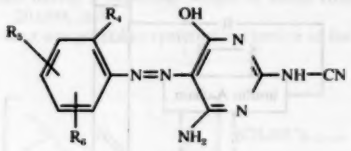
Filed Oct. 9, 1974, Ser. No. 513,486

Claims priority, application Germany, Oct. 12, 1973, 2351294

Int. Cl.² C09B *29/36;* **C04B** *7/02;* **D06P** *3/26, 3/54*

U.S. Cl. 260—154 **7 Claims**

1. An azo pigment which is free from groups conferring solubility in water of the formula



wherein

R_4 represents carbo-C_1-C_4-alkoxy or C_1-C_4-alkoxy;

R_5 represents hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, cyano, carbo-C_1-C_4-alkoxy or carbonamide unsubstituted or mono- or disubstituted by methyl or phenyl; and

R_6 represents hydrogen, chlorine, methyl or methoxy.

4,014,864

HETEROCYCLIC SUBSTITUTED AZO DYESTUFF

Ved Parkash Kubba, Bombay, India, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

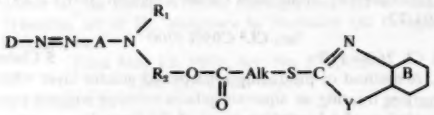
Filed Feb. 13, 1976, Ser. No. 657,776

Claims priority, application Switzerland, Feb. 25, 1975, 2374/75

Int. Cl.² C07D *277/04;* **C09B** *29/36, 49/06;* **C07D** *233/02*

U.S. Cl. 260—157 **16 Claims**

1. An azo compound that is free from sulphonic acid groups of the formula



in which D represents the radical of a diazo component, A represents an optionally substituted, 1,4-phenylene radical, R_1 represents an optionally substituted alkyl radical, R_2 represents an optionally substituted alkylene radical, Alk represents an alkylene radical of 1–4 carbon atoms and Y represents an imino group, a sulphur atom or an oxygen atom and ring B may be substituted by bromine, fluorine, chlorine atoms, cyano, nitro, trifluoromethyl, alkyl, alkoxy, acylamino, acyloxy, carbalkoxy, optionally N-alkylated carbamoyl and optionally N-alkylated sulphamoyl groups and by a benzo residue.

4,014,865

GOLDEN-YELLOW FIBER-REACTIVE WATER-SOLUBLE MONOAZO DYESTUFFS

Fritz Meininger, Frankfurt am Main, and Ludwig Schlafer, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

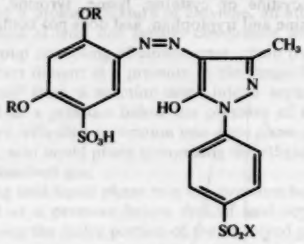
Filed June 26, 1975, Ser. No. 590,576

Claims priority, application Germany, June 29, 1974, 2431343

Int. Cl.² C09B *29/38*

U.S. Cl. 260—163 **2 Claims**

1. Monoazo compound being in the form of the free acid of the formula



in which R is alkyl of 1 to 4 carbon atoms and X is vinyl or β-sulfatoethyl.

4,014,866

BARIUM LAKED PHENYLAZONAPHTHALENE DYE CONTAINING SULFONIC ACID GROUPS

Georg Henning, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhein), Germany

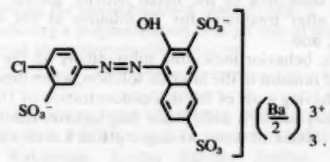
Continuation-in-part of Ser. Nos. 297,198, Oct. 13, 1972, abandoned, and Ser. No. 414,715, Nov. 12, 1973, abandoned. This application May 29, 1975, Ser. No. 581,714

Claims priority, application Germany, Oct. 20, 1971, 2152190

Int. Cl.² C09B *29/16;* **C09D** *11/00;* **D06P** *1/06, 3/00*

U.S. Cl. 260—200 **1 Claim**

1. The pigment of the formula:



4,014,867

PRODUCTION OF HEXAMETHYLENEIMINE FROM CAPROLACTAM

Chuen Y. Yeh, Succasunna, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 23, 1975, Ser. No. 616,105

Int. Cl.² C07D *295/02*

U.S. Cl. 260—239 B **20 Claims**

1. A method of preparing hexamethyleneimime which comprises the steps of:

a. forming a solution of ε-caprolactam in a solvent selected from the group consisting of linear and cyclic ethers and polyethers having a boiling point of at least about 100°C., said solution having a concentration of about 1 to 40 percent by weight;

b. contacting said solution with gaseous hydrogen in the

presence of a catalyst comprising copper chromite and at a temperature of about 185° to 215° C. and a pressure of at least about 1,000 psig, whereby a solution containing hexamethyleneimine is formed; and

c. recovering hexamethyleneimine from said hexamethyleneimine-containing solution.

4,014,868

PREPARATION OF β-LACTAM ANTIBIOTICS

Antony Rodney Berry, and Ian David Camburn, both of Worthing, England, assignors to Beecham Group Limited, Great Britain

Filed Sept. 2, 1975, Ser. No. 609,620

Claims priority, application United Kingdom, Sept. 25, 1974, 41610/74

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **9 Claims**

1. A process for the preparation of the sodium salt of amoxycillin which consists essentially of (a) forming a slurry of amoxycillin in a mixture of dichloromethane and methanol; (b) bringing about the dissolution of the amoxycillin by the addition of sodium methoxide at a temperature below 0° C; (c) precipitating the resulting salt by the addition of an organic solvent; and (d) isolating the precipitated sodium salt of amoxycillin.

4,014,869

CEPHALOSPORIN DERIVATIVES

Gordon Ian Gregory, Chalfont St. Peter; Michael Gregson, London, and Godfrey Basil Webb, Greenford, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

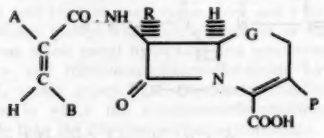
Filed Dec. 2, 1974, Ser. No. 528,944

Claims priority, application United Kingdom, Dec. 5, 1973, 56460/73

Int. Cl.² C07D *501/20*

U.S. Cl. 260—240 J **7 Claims**

1. A 7β-acrylamidoceph-3-em-4-carboxylic acid of the formula:



(I)

wherein A is phenyl; naphthyl; thenyl; furyl; optionally substituted by a cyano group; B is a group as defined for A; or alkyl, alkenyl or alkynyl of up to 7 carbon atoms or said alkyl, alkenyl or alkynyl substituted by a group as defined for A, C_{1-4} alkoxy, or D_{1-4} acyloxy; R is hydrogen; G is =S; P is a group of the formula $-CH_2Y$ wherein Y is $-O.CO.R^d$, wherein R^d is C_{1-7} alkyl; C_{1-7} alkyl substituted by cyano, carboxy, C_{1-4} alkoxycarbonyl, hydroxy, carboxycarbonyl, chlorine, bromine, iodine or amino; C_{2-7} alkenyl; phenyl; phenyl substituted by hydroxy; chloro; fluoro, methyl, nitro, amino, methoxy or methylthio; thienyl; pyridyl; cyclohexyl; cyclopentyl; cyclopropyl; sydnone; naphthyl or 2-ethoxynaphthyl; or $-O.CO.Q.R^d$ wherein R^d is as defined above, or hydrogen and Q is O, S or NH; or a physiologically acceptable salt thereof.

4,014,870

STILBENE COMPOUNDS

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

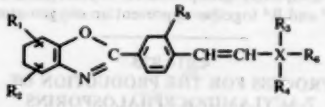
Filed June 10, 1975, Ser. No. 585,539

Claims priority, application Switzerland, June 12, 1974, 8031/74; June 12, 1974, 8035/74

Int. Cl.² C07D *263/54*

U.S. Cl. 260—240 CA **8 Claims**

1. A stilbene compound of the formula



wherein

X denotes a 4-biphenyl radical,

R_1 denotes hydrogen, alkyl having 1 to 4 carbon atoms, chlorine, cyclohexyl, carbalkoxy having 2 to 5 carbon atoms, carboxyl or sulpho,

R_2 denotes hydrogen or alkyl having 1 to 4 carbon atoms,

R_3 denotes hydrogen or sulpho,

R_4 denotes hydrogen,

R_5 denotes hydrogen, or sulpho, and

R_6 denotes hydrogen or sulpho, the molecule containing at least one but not more than two sulpho groups.

4,014,871

STILBENE COMPOUNDS

Géza Kormány, Allschwil; Guglielmo Kabas, Aesch; Hans Schläpfer, and Adolf Emil Siegrist, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

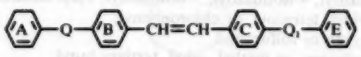
Filed Aug. 6, 1975, Ser. No. 601,882

Claims priority, application Switzerland, Aug. 14, 1974, 11109/74

Int. Cl.² C07D *413/10*

U.S. Cl. 260—240 C **12 Claims**

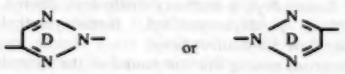
1. Stilbene compounds of the fiormula



wherein

Q denotes the 1,3,4-oxadiazol-2,5-ylene or 1,2,4-oxadiazol-3,5-ylene radical and

Q_1 denotes one of the radicals



and the rings A, and E can each contain up to 2 non-chromophoric substituents.

4,014,872

SUBSTITUTED 3-HYDROXY- OR 3-OXO-CEPHAMS

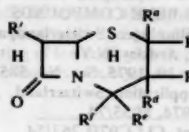
John Derek Cocker, Chalfont St. Peter, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed Jan. 3, 1974, Ser. No. 430,386

Int. Cl.² C07D *501/14*

U.S. Cl. 260—243 C **4 Claims**

1. 3-Hydroxy and 3-oxo-7-amino and protected amino-(6R, 7R)-cephams having the formula:



wherein R^1 represents a free or protected amino group; R^a, R^b, R^e and R^f each represent a hydrogen atom, and either R^c represents a hydroxy group and R^d represents a hydrogen atom or R^c and R^d together represent an oxygen atom.

4,014,873

PROCESS FOR THE PRODUCTION OF 7-ACYLAMIDOCEPHALOSPORINS

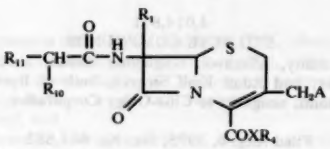
Burton G. Christensen, Scotch Plains; Lovji D. Cama, Edison; Meyer Sletzinger, North Plainfield, and Sandor Karady, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 356,873, May 3, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 149,364, June 2, 1971, abandoned, and Ser. No. 223,005, Feb. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 149,364, June 2, 1971. This application Nov. 29, 1974, Ser. No. 528,109

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **7 Claims**

1. The process for preparing the compound of the formula:



wherein R_1 is hydrogen or methoxy;

A is loweralkanoyloxy of 2-6 carbon atoms or carbamoyloxy;

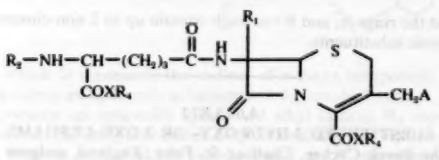
R_{10} is hydrogen, azido, carboxy, or hydroxy;

R_{11} is phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 3-isothiazoyl, 4-isothiazoyl, 5-isothiazoyl, 1,2,5-thiadiazoyl, 4-pyridyl, tetrazoyl, or chlorophenyl;

X is oxygen or sulfur; and

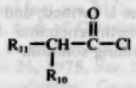
R_4 is hydrogen, or methyl, ethyl, tertiary butyl, phthalimidomethyl, succinimidomethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, 2-methylthioethyl, 2-(p-methylphenyl)ethyl, 2-(p-methylphenyl)-sulfonylethyl, 2-methylaminoethyl, 2-chloro(or bromo-)ethyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2,4,6-trimethylbenzyl, 3,5-dichloro-4-hydroxybenzyl, benzhydryl, p-methoxybenzhydryl, phenyl, acetoxymethyl, pivaloyloxymethyl, methoxymethyl, p-nitrophenyl or 3,5-dinitrophenyl;

which comprises mixing the compound of the formula:



in which R_2 is trichloroethoxycarbonyl, tertiary butoxy carbonyl, benzoylmethoxycarbonyl, trimethylsilyl, p-methoxybenzyloxy, 2-nitrophenylsulfenyl, 2,4-dinitrophenylsulfenyl, chloroacetyl, or o-nitrophenylthio; and R_1, A, X and R_4 are as above defined,

with an approximately equimolar amount of the acylating agent having the formula



where R_{11} and R_{10} are as defined above and with a molecular excess of the silylating agent which is N-(trimethylsilyl)acetamide, N-(tripropylsilyl)acetamide, N-(tributylsilyl)acetamide, N-(triphenylsilyl)acetamide or N-(tribenzylsilyl)acetamide, N,O-bis(trimethylsilyl)acetamide, N,O-bis(triphenylsilyl)acetamide, N,O-bis(tribenzylsilyl)acetamide, N-(trimethylsilyl)trifluoroacetamide, N-(tributylsilyl)trifluoroacetamide, N-(trimethylsilyl)-benzoamide, N-(trimethylsilyl)diphenylurea, N-(trimethylsilyl)ethylcarbamate, N-triphenylsuccinimide or N-(trimethylsilyl)phthalimide, N-(trimethylsilyl)benzene sulfonamide, N-trimethylsilyl urethane, N-trimethylsilyl phthalimide, monosilyltrifluoroacetamide or bis(ethoxycarbonylamino)dimethyl silane in an inert solvent at a temperature of between about 25° C and about 70° C. for a duration of 3–65 hours, and then optionally adding loweralkanol or loweralkylthiol, alkyl having 1–6 carbon atoms benzylalcohol, 2.5N HCl or aqueous sodium bicarbonate; and recovering the product.

4,014,874

PROCESS FOR THE MANUFACTURE OF 3-SUBSTITUTED THIOMETHYL-7-AMINO-2-CEPHEM-4-CARBOXYLIC ACID COMPOUND

Heinrich Peter, Binningen; Beat Müller, Reinach, both of Switzerland; Walter Sibral, Tulln, Austria, and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

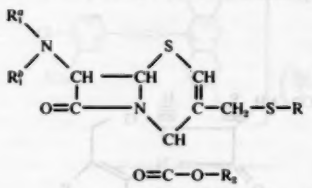
Filed Jan. 27, 1975, Ser. No. 544,442

Claims priority, application Switzerland, Feb. 5, 1974, 1555/74

Int. Cl.² C07D *501/06*

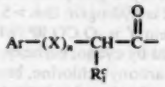
U.S. Cl. 260—243 C **5 Claims**

1. Process for the manufacture of a member selected from the group consisting of 7-N-R_1^a-N-R_1^b-amino-3-R-thiomethyl-2-cephem-4 carboxylic acid compounds of the formula



(I)

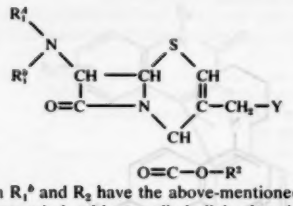
wherein R represents methyl, thiadiazolyl, tetrazolyl, methyl-substituted thiadiazolyl, or methyl-substituted tetrazolyl, R_1^b is hydrogen, R_1^a represents hydrogen, cyanoacetyl or an acyl radical of the formula



(Ib)

wherein Ar is phenyl or tetrazolyl, X is oxygen, *n* denoted 0 or 1 and R_1^c denotes hydrogen or, if *n* represents 0, denotes α-poly-branched lower alkoxycarbonylamino, phenyl-lower alkoxycarbonylamino or phenyl-lower alkoxycarbonylamino

substituted by lower alkoxy, nitro, or hydroxyl, α-polybranched lower alkoxycarbonyloxy, 2-halogeno-lower alkoxycarbonyloxy, or formyloxy, or represents a 5-amino-5-carboxyvaleryl radical, wherein the amino and/or carboxyl group are optionally present, as lower alkanoylamino, dichloroacetylamino, or phthaloylamino, or as phenyl-lower alkoxycarbonyl, and R_2 denotes hydrogen, lower alkyl, α-polybranched lower alkyl, or 2 halogeno-lower alkyl, nitrobenzyl, diphenylmethyl or lower alkoxy-substituted diphenylmethyl, and salts of such compounds with alkali and alkaline earth metals, ammonia or organic amines, if R_2 represents hydrogen, or with inorganic acids or organic sulfonic acids, if R_1^a and R_1^b both represent hydrogen or inner salts of such compounds, if R_2, R_1^a and R_1^b all represent hydrogen, wherein a 7-(N-R_1^4-N-R_1^5-amino)-3-Y-methyl-2-cephem-4-carboxylic acid compound of the formula



(II)

wherein R_1^b and R_2 have the above-mentioned meanings, R_1^4 represents trityl, tri-lower alkyl silyl, phenylglycyl, phenylacetyl or phenoxyacetyl , and Y represents hydroxy, lower alkanoyloxy or halogeno acetoxy, is reacted with a compound of the formula R-SH (III), in the presence of trifluoroacetic acid with the proviso that when Y represents trifluoroacetoxy, the reaction can be carried out in the absence of trifluoroacetic acid.

4,014,875

PROCESS OF MAKING DI OR TRIBROMOMETHANESULFONAMIDES

Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 326,609, Jan. 26, 1973, Pat. No. 3,892,743. This application Apr. 11, 1975, Ser. No. 567,455

Int. Cl.² C07D *265/30*

U.S. Cl. 260—247.1 R **1 Claim**

1. A process for making dibromo- and tribromomethanesulfonamides by reacting a diamide of sulfoacetic acid having two NR_1R_2 amide groups wherein NR_1R_2 is a heterocyclic ring which may contain one oxygen atom and 1 to 2 lower alkyl substituent groups with excess bromine in the presence of aqueous alkali metal hydroxide and recovering product dibromo- and tribromomethanesulfonamide having the said NR_1R_2 amide group by fractional recyrstallization from a solvent in which the tribromomethanesulfonamide is less soluble than the dibromomethanesulfonamide.

4,014,876

ISOXAZOLE DERIVATIVES

Shinzaburo Sumimoto, Osaka; Yoshihiro Tochino, Habikino, and Manabu Fujimoto, Nagaokakyo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

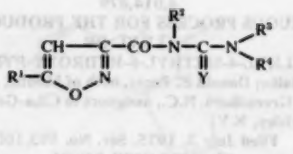
Continuation-in-part of Ser. No. 88,987, Nov. 12, 1970, abandoned. This application Jan. 19, 1973, Ser. No. 325,115

Claims priority, application Japan, Nov. 12, 1969, 44-90619

Int. Cl.² C07D *295/00, 261/06*

U.S. Cl. 260—247.2 A **34 Claims**

1. A compound of the formula



wherein each of R^1 and R^2 is hydrogen, alkyl of 1 to 8 carbon atoms or cycloalkyl of 3 to 10 carbon atoms, each of R^3 and R^4 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 10 carbon atoms or phenyl, or the group

is morpholino, and Y is oxo.

4,014,877

SUBSTITUTED BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

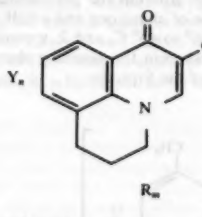
Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,144

The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.

Int. Cl.² C07D *413/06*

U.S. Cl. 260—247.5 GP **5 Claims**

1. A compound having the formula



wherein Y is lower alkyl, lower alkoxy, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, lower alkanamido, trifluoroacetamido or N,N-lower dialkylamino; R is methyl, ethyl or trifluoromethyl; n is zero, one or two; m is zero, one or two, and when R is trifluoromethyl, m is one; and R^1 is halogen, amino, lower alkylamido, N,N-lower dialkylamino hydrazino, morpholino or piperidino.

4,014,878

2-(3-MORPHOLINOPROPYL)-5,6-DIMETHOXY INDAZOLE

Thomas J. Schwan; Charles S. Davis, both of Norwich, and LeRoy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No. 3,966,760. This application Feb. 25, 1976, Ser. No. 661,344

Int. Cl.² C07D *413/06*

U.S. Cl. 260—247.5 EP **1 Claim**

1. The compound 2-(3-morpholinopropyl)-5,5-dimethoxyindazole dihydrochloride.

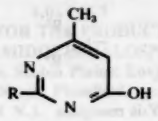
4,014,879

CONTINUOUS PROCESS FOR THE PRODUCTION OF 2-ALKYL OR CYCLOALKYL-4-METHYL-6-HYDROXY-PYRIMIDINES

David E. Balke; Donald E. Perez, both of Mobile, Ala., and Yel S. Sury, Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 3, 1975, Ser. No. 593,100
Int. Cl.² C07D 239/26
U.S. Cl. 260—251 R **2 Claims**

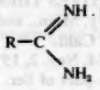
1. A continuous ring-closure/neutralization process for the preparation of a 2-alkyl or 2-cycloalkyl-4-methyl-6-hydroxy-pyrimidine of the formula



wherein R represents alkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms, which process comprises

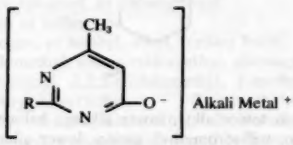
1. **a continuous ring-closure step in two stages wherein:**

a. an amidine of the formula



wherein R has the same meaning as given above, is fed continuously into a first-stage reactor simultaneously with methylacetoacetate and an aqueous alkali solution for pH control, for a retention time of about one hour at a temperature of 40° to 45° C, and

b. the reaction mass is then continuously fed to a second-stage reactor simultaneous with another amount of an aqueous alkali solution for pH control for a further retention time of about one and a half hours at a temperature of 40° to 45° C, and 2. a continuous neutralization step wherein the resulting slurry of alkali oxypyrimidine of the formula



wherein R has the same meaning as given above, is continuously fed with simultaneous addition of an inorganic or organic acid to the neutralizer, wherein the continuous neutralization is performed at a pH between about 6 and 7, at a temperature ranging between about 0° to 10° C and a retention time of about 30 minutes.

4,014,880

PROCESS FOR MAKING IMIDAZOLINES AND TETRAHYDROPYRIMIDINES FROM OXAZOLINES AND ALKYLENEDIAMINES

William Dowd, and Peter W. Owen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 9, 1976, Ser. No. 656,558
Int. Cl.² C07D 239/00
U.S. Cl. 260—251 R **9 Claims**

1. In the method of preparing a 2-imidazoline or a 1,4,5,6-tetrahydropyrimidine by reacting (a) a 2-oxazoline with (b) 1,2-alkylenediamine or a 1,3-alkylenediamine in liquid-phase, the improvement comprising conducting the reaction in the presence of a small but sufficient amount of a Lewis acid to catalyze the reaction between (a) and (b).

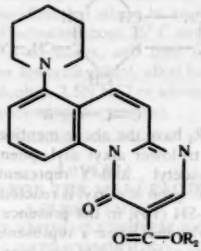
4,014,881

1-OXO-1H-6-PIPERIDINOPYRIMIDO[1,2-a]QUINOLINE-2-CARBOXYLIC ACIDS AND ESTERS

Saul B. Kadin, and Peter F. Moore, both of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed July 10, 1975, Ser. No. 594,766
Int. Cl.² C07D 401/04
U.S. Cl. 260—256.4 Q **3 Claims**

1. A compound having the formula



wherein R_2 is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms, the pharmaceutically-acceptable acid addition salts thereof, and the pharamaceutically-acceptable cationic salts of those compounds wherein R_2 is hydrogen.

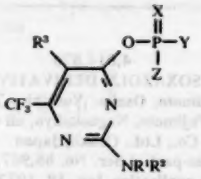
4,014,882

TRIFLUOROMETHYL SUBSTITUTED PYRIMIDINE DERIVATIVES USEFUL AS INSECTICIDES

Stuart Peter Sharpe, Yateley, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 456,383, March 29, 1974,. This application Jan. 5, 1976, Ser. No. 646,832
Claims priority, application United Kingdom, May 25, 1973, 25207/73
Int. Cl.² C07D 239/30, 239/46
U.S. Cl. 260—256.5 R **8 Claims**

1. A compound of formula:



wherein X is oxygen or sulphur; Y and Z are alkoxy having from one to four carbon atoms; R^1 and R^2 are alkyl having from one to four carbon atoms; and R^3 is hydrogen or halogen.

4,014,883

INDOLOQUINOLINES, INTERMEDIATES AND PROCESSES

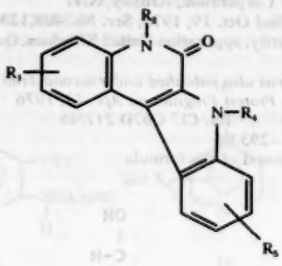
Rodney Ian Fryer, North Caldwell; Robert Ye-Fong Ning, West Caldwell; Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 395,871, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,193, Sept. 25, 1972, abandoned. This application July 16, 1975, Ser. No. 596,684

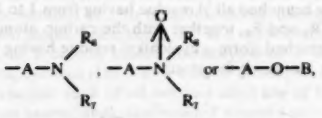
Int. Cl.² C07D *471/04*

U.S. Cl. 260—288 CF 15 Claims

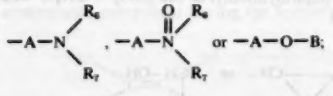
1. A compound of the formula



wherein R_1 and R_3, independently, are hydrogen, halogen, trifluoromethyl, lower alkyl of 1 of 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; R_2 and R_4, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, cyano-lower alkyl wherein lower alkyl is of 1 to 7 carbon atoms, dihydroxy-lower alkyl of 1 to 7 carbon atoms, 2,3-epoxy-propyl, lower alkenyl of 2 of 7 carbon atoms,

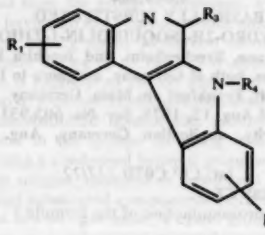


wherein A is a straight chain lower alkylene of 1–7 carbon atoms or a straight chain lower alkylene of 1 to 7 carbon atoms mono-substituted by lower alkyl of 1–7 carbon atoms, R_6 and R_7, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1–7 carbon atoms or methylpiperidino, and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; provided that at least one of R_2 or R_4 is

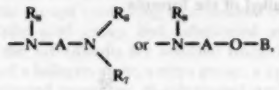


or an addition salt thereof with a pharmaceutically acceptable acid.

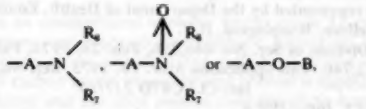
11. A compound of the formula



wherein R_1 is hydrogen, halogen, trifluoromethyl, lower alkyl of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; R_3 is hydrogen, halogen, trifluoromethyl, hydrazino, lower alkyl of 1 to 7 carbon atoms, amino, lower alkylamino of 1 to 7 carbon atoms, di-lower alkylamino of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, lower alkoxyamino of 1 to 7 carbon atoms,



wherein A is a straight chain lower alkylene of 2–7 carbon atoms or a straight-chain lower alkylene of 2 to 7 carbon atoms mono-substituted by lower alkyl of 1 to 7 carbon atoms, R_6 and R_7, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1–7 carbon atoms or methylpiperidino, R_8 is hydrogen or lower alkyl of 1 to 7 carbon atoms and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; R_4 is hydrogen, lower alkyl of 1 to 7 carbon atoms,



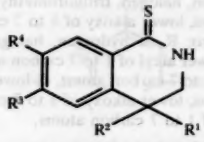
or -A-O-B, wherein A is a straight chain lower alkylene of 2–7 carbon atoms or a straight chain lower alkylene of 2–7 carbon atoms mono-substituted by lower alkyl of 1–7 carbon atoms, R_6 and R_7, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1–7 carbon atoms an methylpiperidino, and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; and R_8 is halogen, lower alkyl of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; provided that at least one of R_3 or R_4 is a basic amino side chain or —A—O—B, or an addition salt thereof with a pharmaceutically acceptable acid.

4,014,884
BASICALLY SUBSTITUTED 3,4-DIHYDRO-2H-ISOQUINOLIN-1-THIONES

Rudolf Kunstmann, Breckenheim, and Joachim Kaiser, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

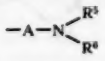
Filed Aug. 12, 1975, Ser. No. 603,931
Claims priority, application Germany, Aug. 14, 1974, 2438965
Int. Cl.² C07D 217/22
U.S. Cl. 260—288 CE **5 Claims**

1. A 3,4-dihydroisoquinoline of the formula I



I

wherein R^1 is hydrogen, saturated straight-chained or branched alkyl having 1 to 6 carbon atoms or phenyl, R_2 is dialkylaminoalkyl of the formula



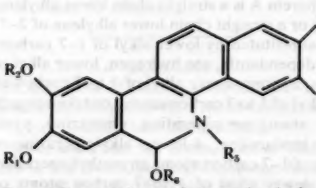
wherein A is straight-chained or branched low molecular alkylene having 2–3 carbon atoms and R^5 and R^6 are identical or different and are straight-chained or branched, low molecular alkyl having 1–4 carbon atoms and may form together with the nitrogen atom a 5- or 6-membered ring, R^3 and R^4 are identical or different and are hydrogen or lower alkoxy having 1 to 4 carbon atoms as well as the physiologically tolerable salts thereof.

4,014,885
ANTI-LEUKEMIC OXYGENATED BENZO[C]PHENANTHRIDINE COMPOUNDS

Kwang Yuen Zee-Cheng, and Chia-Chung Cheng, both of Kansas City, Mo., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 446,896, Feb. 28, 1974, Pat. No. 3,912,740. This application Mar. 10, 1975, Ser. No. 557,183
Int. Cl.² C07D 217/16
U.S. Cl. 260—289 A **3 Claims**

1. 5,6-Dihydro-6-alkoxynitidine compounds of the formula



wherein R_1 and R_2 are selected independently from the group consisting of C_1-C_6 alkyl roups, H and benzyl or R_1 and R_2 taken together are methylene and R_3, R_4, R_5 and R_6 are selected independently from the group consisting of C_1C_6 alkyl groups, H and benzyl.

4,014,886
2-SUBSTITUTED-5,6-DIMETHOXYINDAZOLES

Thomas J. Schwan; Charles S. Davis, both of Norwich, and LeRoy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No. 3,966,760. This application Feb. 25, 1976, Ser. No. 661,392
Int. Cl.² C07D 401/04
U.S. Cl. 260—293.6 **2 Claims**

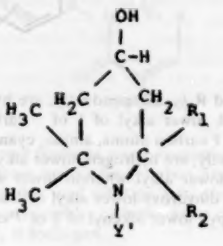
1. The compound 2-(2,6-dimethylpiperidino)-5,6-dimethoxyindazole.

4,014,887
SUBSTITUTED PIPERIDIN-4-OLS

Donald Richard Randell, Stockport; Brian Holt, Royton, and Alan Geoffrey Virgin, Swinton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

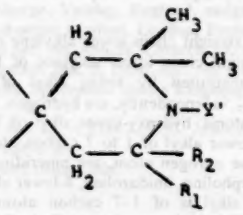
Filed Oct. 19, 1973, Ser. No. 408,123
Claims priority, application United Kingdom, Oct. 21, 1972, 48601/72
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² C07D 211/46
U.S. Cl. 260—293.84 **7 Claims**

1. A compound of the formula

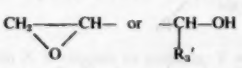


[II]

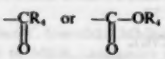
wherein R_1 and R_2 are the same or different and each is a straight- or branched alkyl residue having from 1 to 12 carbon atoms, or R_1 and R_2, together with the carbon atom to which they are attached, form a cycloalkyl residue having from 5 to 12 carbon atoms, or the group:



wherein R_1 and R_2 are as defined above and Y′ is a straight- or branched alkyl having from 5 to 20 carbon atoms, an alkenyl or alkynyl having from 3 to 20 carbon atoms, an aralkyl selected from benzyl, α-methylbenzyl, p-methyl- α-methylbenzyl and α-naphthylmethyl or the group $—CH_2X'$ wherein X′ is the group



wherein R_3' is hydrogen or a methyl residue, or X is the group



wherein R_4 is alkyl residue having from 1 to 20 carbon atoms.

4,014,888

SUBSTITUTED PYRIDINE CARBOXYLIC ACIDS AND DERIVATIVES

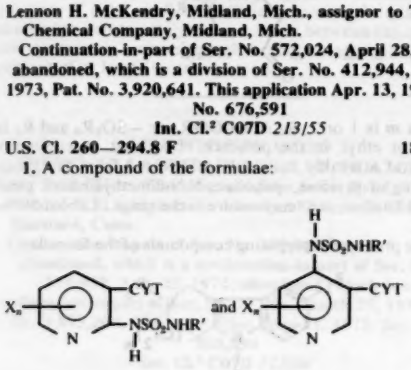
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 572,024, April 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Apr. 13, 1976, Ser. No. 676,591

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 F **18 Claims**

1. A compound of the formulae:



III IV

wherein:

each X independently represents loweralkyl, of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents oxygen;

T represents a member selected from the group consisting of hydroxy, alkoxy of 1 to 3 carbon atoms and halo;

R′ represents hydrogen, loweralkyl of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, haloalkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, haloalkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyalkyl wherein each of alkoxy and alkyl are of from 1 to 6 carbon atoms, dialkylaminoalkyl wherein each alkyl is of from 1 to 6 carbon atoms, or $—C(CH_3)_2C \equiv N$;

each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;

R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,014,889

PROCESS FOR PREPARING KETONES

Hermann Stetter, Aachen-Laurensberg, and Manfred Schreckenberg, Aachen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

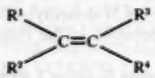
Division of Ser. No. 424,231, Dec. 12, 1973, abandoned. This application June 11, 1975, Ser. No. 586,118

Int. Cl.² C07D *213/50*

U.S. Cl. 260—294.9 **9 Claims**

1. Process for preparing ketones which comprises contacting in the presence of a cyanide ion:

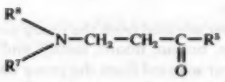
A. an unsaturated compound having the formula (I):



(I)

wherein R^1, and R^2 and R^3 are the same or different and are selected from the group of hydrogen, unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion contains up to 6 carbon atoms, unsubstituted phenyl or naphthyl, unsubstituted heterocyclic groups having 5 or 6 members in the groups including heterocyclic groups containing a condensed benzene group where the hetero-atom is oxygen, nitrogen or sulfur and carboxylic acid ester and substituted components thereof where the substituent is a halogen atom, a cyano group, a nitro group, a mono- or di-substituted or unsubstituted amino group, an alkyl group having up to 6 carbon atoms, a phenyl group, hydroxyl, alkoxy, alkylthio, carboxylic acid ester and a thiocarboxlyic acid ester group with up to 6 carbon atoms, alkylcarbonyl, arylcarbonyl, alkylthiocarbonyl or arylthiocarbonyl group and R^4 is nitrile (CN), —CO—R^5 or —CO—OR^5 wherein R^5 is selected from the group of unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion is up to 6 carbon atoms, phenyl, naphthyl, a 5 or 6 member heterocyclic group including heterocyclic groups containing a condensed benzyl group, a carboxylic acid group and substituted groups thereof where the substituents are selected from the group consisting of a halogen atom, a nitro group, a cyano group, an unsubstituted mono- or di-substituted amino group, an alkyl group containing up to 6 carbon atoms, a phenyl group a hydroxyl group, an alkoxy group, an alkylthio group, a carboxylic acid ester group having up to 6 carbon atoms, a thiocarboxylic acid ester group having up to 6 carbon atoms, an alkylcarbonyl group, an arylcarbonyl group, an alkylthiocarbonyl group and an arylthiocarbonyl group and R^1, R^2 and/or R^1 and R^3 and/or R^2 and R^5 or R^3 and R^5 together with the carbon atoms to which they are attached as substituents can form a carboxylic or heterocyclic ring, or

B. a Mannich base having the formula



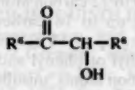
wherein

R^5 is an unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion contains up to 6 carbon atoms, unsubstituted phenyl or naphthyl, unsubstituted heterocyclic groups having 5 or 6 members in the groups including heterocyclic groups containing a condensed benzene group where the hetero atom is oxygen, nitrogen or sulfur and substituted components of said aliphatic, cycloaliphatic, araliphatic, phenyl, naphthyl or heterocyclic groups where the substituent is a halogen atom, a cyano group, a nitro group, a mono or di-substituted or unsubstituted amino group, an alkyl group having up to 6 carbon atoms, a phenyl group, hydroxyl, alkoxy, alkylthio, carboxylic acid ester and a thiocarboxylic acid ester group with up to 6 carbon atoms, alkylcarbonyl, arylcarbonyl, alkylthiocarbonyl or arylthiocarbonyl groups;

R^7 and R^8 are each independently aliphatic having up to 12 carbon atoms or together with the nitrogen atom of said Mannich base form a 5 or 6 membered ring, with:

C. an aromatic or heterocyclic aldehyde; or

D. a benzoin having the formula



wherein

R^6 is a substituted or unsubstituted naphthyl or phenyl group or a 5 or 6 member heterocyclic group where the hetero atom is oxygen, sulfur or nitrogen.

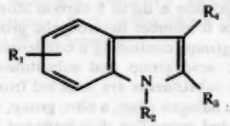
4,014,890

PROCESS FOR PREPARING INDOLE DERIVATIVES

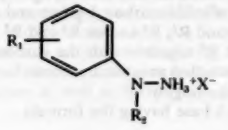
Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,507
Int. Cl.² C07D 471/04
U.S. Cl. 260—296 A 11 Claims

1. The process for preparing compounds of the formula:



which comprises reacting a phenylhydrazine acid addition salt of the formula:



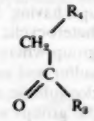
where

X is Cl or Br;

R_1 is a member selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl and methoxy;

R_2 is a member selected from the group consisting of hydrogen, alkyl having from one to three carbon atoms, $-C_6H_4R_1$, $-CH_2CH_2NR_7R_8$ and $-CH_2CH_2-CH_2NR_7R_8$ wherein R_7 and R_8 are each alkyl having from one to three carbon atoms;

with the proviso that when R_2 is $-C_6H_4R_1$, both R_1 are the same; with an equimolar amount of a ketone of the formula:

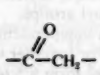


wherein

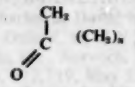
R_3 is methyl;

R_4 is hydrogen;

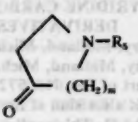
and R_3 and R_4 when taken together with the



moiety to which they ae attached, form

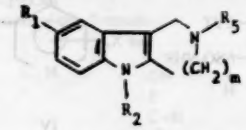


wherein n is an integer from 3 to 6, or

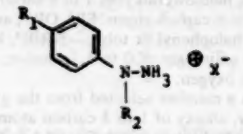


wherein m is 1 or 2; R_5 is $-COOR_6$ or $-SO_2R_6$ and R_6 is methyl or ethyl; in the presence of at least an equimolar amount of a weakly basic solvent selected from the group consisting of pyridine, quinoline, N,N-dimethylaniline, picoline and lutidine, at a temperature in the range of about 50° to 180° C.

2. The process for preparing compounds of the formula:



which comprises the reaction of a phenylhydrazine acid addition salt of the formula:

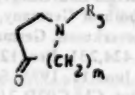


wherein X is Cl or Br;

R_1 is a member selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen;

R_2 is a member selected from the group consisting of hydrogen, phenyl and phenyl substituted in the 4-position by a member of the group consisting of fluoro and chloro; with the proviso that when R_2 is said phenyl substituted by fluoro, R_1 is fluoro and when R_2 is said phenyl substituted by chloro, R_1 is chloro;

with an equimolar amount of a ketone of the formula:



wherein m is 1 or 2; R_5 is $-COOR_6$ or $-SO_2R_6$ and R_6 is methyl or ethyl;

in the presence of at least an equimolar amount of a weakly basic solvent selected from the group consisting of pyridine, quinoline, N,N-dimethylaniline, picoline, and lutidine, at a temperature in the range of about 50 to 180° C.

3. The process according to claim 2 wherein m is 2; R_1 is selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen; R_2 is hydrogen; and R_5 is $-COOC_2H_5$.

4,014,891

PROCESS FOR MAKING ARYL CHLOROMETHYL SULFIDES

Christian T. Goralski, Midland, and George A. Burk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1975, Ser. No. 540,734
Int. Cl.² C07C *148/00, 149/34;* C07D *277/36*
U.S. Cl. 260—302 SD 14 Claims

1. A process for preparing an aryl chloromethyl sulfide comprising reacting by contacting in liquid phase (a) an alkali metal aryl mercaptide with (b) bromochloromethane in the presence of (c) a small but sufficient amount of a quaternary ammonium salt to catalyze the reaction between (a) and (b); said quaternary ammonium salt having an aggregate carbon content of at least 10 carbon atoms.

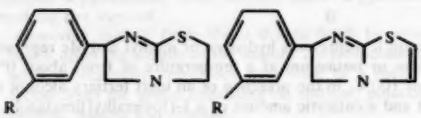
4,014,892

6-SUBSTITUTED AMINO PHENYL-2,3,5,6-TETRAHYDRO[2,1-B]THIAZOLES

Larry Dean Spicer, Princeton, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 289,016, Sept. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,939, Aug. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 22,701, March 25, 1970, Pat. No. 3,673,205. This application June 11, 1975, Ser. No. 585,994
Int. Cl.² C07D *513/04*
U.S. Cl. 260—306.7 T 19 Claims

1. A racemic or levorotatory isomer of a compound represented by the formulae:



(I) and (II)

wherein R is furfurylamino, p-methoxybenzylamino, 3-pyridylmethylamino, methoxycarbonylamino, cyclohexylcarbonylamino, benzylcarbonylamino, benzoylamino, p-methoxybenzoylamino, p-chlorobenzoylamino, m-chlorobenzoylamino, 3,4-dichlorobenzoylamino, p-nitrobenzoylamino, 2-furoylamino, benzylamino, cinnamoylamino, n-butyrylamino, isobutyryl amino, trimethylacetylamino, adamantanecarbonylamino, chloroacetylamino or C_4–C_{10} alkanoylamino and a pharmaceutically acceptable salt thereof.

4,014,893

3,4-CYCLOALKANO FUROXANS

John Crosby; Robert Allan Campbell Rennie; John Tanner, all of Runcorn, England, and Robert Michael Paton, Edinburgh, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 467,512, May 6, 1974, Pat. No. 3,931,106. This application Aug. 5, 1975, Ser. No. 602,011
Claims priority, application United Kingdom, May 11, 1973, 22582/73; June 26, 1973, 30218/73; Nov. 12, 1973, 52380/73
Int. Cl.² C07D *271/12*
U.S. Cl. 260—307 DB 2 Claims

1. 3,4-(1′,4′-methano-2,3′-Δ²-propeno)butano furoxan.
2. 3,4-(1′,4′-methano)butano furoxan.

4,014,894

BENZOTRIAZOLE DERIVATIVES

Harry J. Andress, Jr., Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 430,870, Jan. 4, 1974, Pat. No. 3,969,237, which is a continuation-in-part of Ser. No. 344,007, March 27, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,415
Int. Cl.² C07D *249/18*
U.S. Cl. 260—308 B 9 Claims

1. The reaction product of (A) benzotriazole and (B) a reactant selected from the group consisting of oleic acid, dimer acid, trimer acid, mono (nonylphenyl) phosphate, di (nonylphenyl) phosphate, mono (nonylphenyl) phosphonate and di (nonylphenyl) phosphonate, wherein said reaction is conducted at a temperature from about 100° C. to about 200° C. and in a mole ratio of (A) to (B) of from about 1:1 to about 1:0.5.

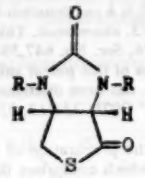
4,014,895

METHOD FOR SYNTHESIS OF OPTICALLY ACTIVE THIOLACTONES

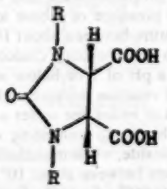
Yasuhiko Aoki, Toyonaka; Hiroyuki Suzuki, Takarazuka; Hisao Akiyama, Nishinomiya, and Shigeru Okano, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 372,606, June 22, 1973, Pat. No. 3,876,656. This application Dec. 13, 1974, Ser. No. 532,477
Claims priority, application Japan, June 22, 1972, 47-63032; Mar. 23, 1973, 48-33912
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.7 8 Claims

1. A process for producing an optically active (+)-thiolactone of the formula:



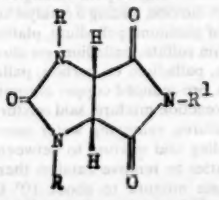
wherein R is a benzyl group, which comprises reacting a dicarboxylic acid of the formula:



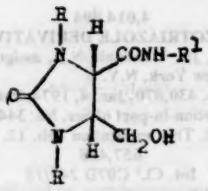
wherein R is as defined above or the acid anhydride, ester or halide thereof with an optically active primary amine of the formula:

$R^1 - NH_2$

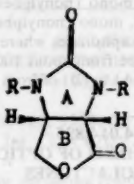
where R^1 is an optically active primary amine residue, reducing the resultant trione of the formula:



wherein R and R^1 are each as defined above, hydrolyzing the resulting amide-alcohol of the formula:



wherein R and R^1 are each defined above and treating the thus obtained lactone of the formula:



wherein R is as defined above with an alkali metal hydrosulfide and carbon disulfide or phosphorus pentasulfide and imidazole.

4,014,896

CATALYTIC DEHYDROGENATION PROCESS FOR THE PREPARATION OF 3,4,5-TRISUBSTITUTED PYRAZOLES

Murray Garber, Trenton; Lawrence James Ross, Martinsville, and Walter Joseph Stepek, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 549,219, Feb. 12, 1975, Pat. No. 3,952,010, which is a continuation-in-part of Ser. No. 398,284, Sept. 17, 1973, abandoned. This application Jan. 8, 1976, Ser. No. 647,384

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² C07D *231/12, 231/18*

U.S. Cl. 260—310 R **5 Claims**

1. The method for the preparation of 3,5-diphenyl-4-alkyl or 4-alkoxy pyrazole which comprises the steps of: reacting either (1) an α-lower alkyl chalcone prepared by bringing in reaction equimolar amounts of a ketone selected from the group consisting of propiophenone and butyrophenone and benzaldehyde in the presence of a base and a C_1–C_4 alcohol solvent, at a temperature between about 10° and 70° C, or (2) the corresponding α-lower alkoxy chalcone, acidifying said reaction mixture to a pH of 7 or below with a mineral acid, treating the acidified reaction mixture with from about 1.0 to 1.5 mole equivalents of hydrazine under a blanket of an inert gas selected from the group consisting of nitrogen, argon, helium and carbon dioxide, while maintaining the temperature of the reaction mixture between about 10° and 70° C, separating from about 65% to 90% of said C_1–C_4 alcohol solvent from the reaction mixture and admixing with the remainder of the reaction mixture an amount of solvent approximately equal to the alcohol separated therefrom and selected from the group consisting of an aromatic solvent, a chlorinated hydrocarbon, and an ether, maintaining the said mixture under a blanket of inert gas selected from the group consisting of nitrogen, argon, helium and carbon dioxide, adding a catalyst selected from the group consisting of platinum, palladium, platinum on alumina, platinum on barium sulfate, palladium on alumina, palladium on barium sulfate, palladium on carbon, palladium on silica, platinum on silica, pre-reduced copper chromite and pla•inum on carbon to the reaction mixture, said mixture being brought to reflux temperatures, removing water azeotropically from said mixture, cooling said mixture to between 100° and 130° C, filtering the latter to remove catalyst there from, further cooling said filtrate mixture to about 10° C, whereby the 3,5-diphenylpyrazole precipitates, and recovering said pyrazole from the reaction mixture.

4,014,897

PROCESS FOR PREPARING CYCLICDICARBOXIMIDO-SUBSTITUTED PHOSPHONOTHIOATES

Ian McLachlan, King's Lynn, England, assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1974, Ser. No. 512,779

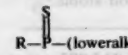
Claims priority, application United Kingdom, Oct. 23, 1973, 49325/73

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

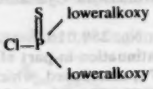
Int. Cl.² C07D *209/48*

U.S. Cl. 260—326 E **6 Claims**

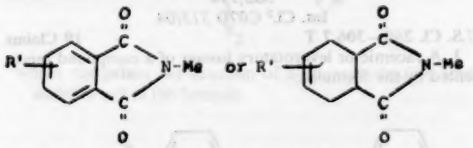
1. A process for preparing cyclicdicarboximido phosphonothioates corresponding to the formula



wherein R represents phthalimido, mono-methyl phthalimido, 4-cyclohexene-1,2-dicarboximido or mono-methyl-4-cyclohexene-1,2-carboximido which comprises reacting a phosphorochloridothioate corresponding to the formula



with an N-alkali-metal cyclicdicarboximide corresponding to the formula



wherein R′ represents hydrogen or methyl and Me represents sodium or potassium at a temperature of from about 0° to about 100°C. in the presence of an inert tertiary alcohol solvent and a catalytic amount of a 1-(loweralkyl)imidazole.

4,014,898

N,N-DIALKYLAMINOETHOXYETHYLPHTHALIMIDOMALONATES

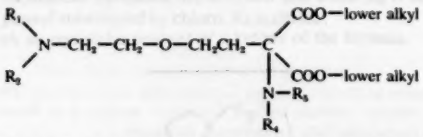
Dennis Keith, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 457,340, April 3, 1974, Pat. No. 3,887,615. This application Mar. 18, 1975, Ser. No. 559,602

Int. Cl.² C07D *209/34*

U.S. Cl. 260—326 N **1 Claim**

1. A compound of the formula



wherein R_1 and R_2 are lower alkyl; and R_4 and R_5 taken together with their attached nitrogen atom form the phthalimido group.

4,014,899

5,6-BENZOISOINDOLINES

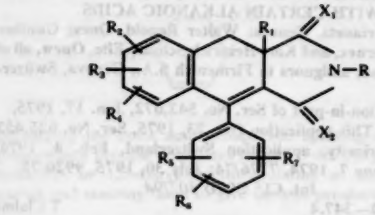
Robert Mathews Bowman, Summit, and Heinz Werner Gschwend, New Providence, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 410,940, Oct. 29, 1973, Pat. No. 3,973,030. This application Mar. 25, 1975, Ser. No. 561,820

Int. Cl.² C07D *209/44*

U.S. Cl. 260—326.1 **6 Claims**

1. A compound of the formula



wherein R is methyl, each of R_1 and R_2 is hydrogen, each of R_3 and R_4 is hydrogen or methoxy in 6- and 7-position, and each of R_5, R_6 and R_7 is methoxy in the 3'-, 4'- and 5'-positions, or R_5 and R_6, when taken together, are methylene-dioxy, and R_7 is hydrogen, and both of X_1 and X_2 are two hydrogens, or a therapeutically acceptable acid addition salt thereof.

4,014,900

PURIFICATION OF 2-PYRROLIDONE

Stephen F. Pusztaszeri, P.O. Box 1181, Port Chester, N.Y. 10573

Continuation-in-part of Ser. No. 224,274, Feb. 7, 1972, abandoned. This application June 24, 1974, Ser. No. 482,166

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.5 FN **10 Claims**

1. A process for producing substantially pure, substantially anhydrous 2-pyrrolidone from impure liquid 2-pyrrolidone comprising the steps of:

a. dissolving therein from about 0.1 to 0.8% by weight, based upon the weight of the impure 2-pyrrolidone, of a solid substantially anhydrous hydroxide of a metal selected from the group consisting of; sodium, potassium, lithium, barium and calcium;

b. applying the hydroxide-pyrrolidone solution as a moving thin film to a heated surface under a vacuum pressure in a molecular distillation apparatus whereby the 2-pyrrolidone is selectively flash vaporized from the heated surface while the non-volatile impurities of the solution remain on the heated surface;

c. condensing the vaporized 2-pyrrolidone on a cooled surface; and

d. collecting the condensed 2-pyrrolidone as substantially pure, substantially anhydrous, colorless and odorless 2-pyrrolidone, wherein the vacuum pressure and the distance between the heated surface and the cooled surface and their respective temperatures are selected so that no vapor-liquid equilibrium is formed and substantially all of the vaporized 2-pyrrolidone molecules move directly from the heated surface to the cooled surface without recondensing on the heated surface.

4,014,901

SYNTHETIC HORMONES FOR INSECT CONTROL

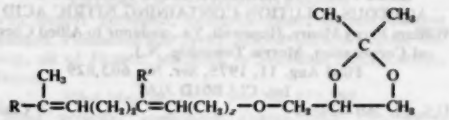
William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,697

Int. Cl.² C07D *317/10*

U.S. Cl. 260—340.9 **1 Claim**

1. A compound of the general formula



wherein R and R' are selected from the group consisting of methyl and ehtyl; and x is a number from 1 to 2.

4,014,902

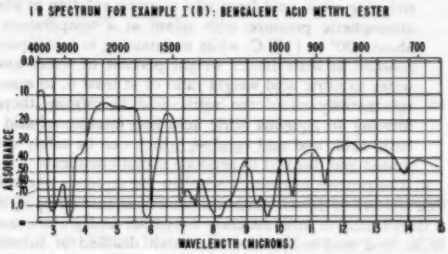
INTERMEDIATE IN THE PROCESS FOR THE PREPARATION OF TRANS-Δ^5-ISOAMBRETTOLIDE

Ching Y. Tseng, Middletown, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

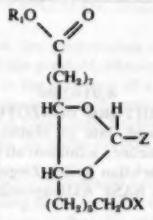
Filed June 9, 1976, Ser. No. 694,452

Int. Cl.² C07D *317/10*

U.S. Cl. 260—340.9 **4 Claims**


IR SPECTRUM FOR EXAMPLE I(B): BENGALENE ACID METHYL ESTER
4000 3000 2000 1500 1000 900 800 700
ABSORBANCE
WAVELENGTH (MICRONS)

1. A mixture of dioxolane derivatives of aleuritic acid having the structure:



wherein X represents H— and

and wherein Z is selected from the group consisting of $—OR_2$ and

and R_1, R_2, R_3 and R_4 are the same or different lower alkyl.

4,014,903
RECOVERY OF DICARBOXYLIC ACIDS FROM AQUEOUS SOLUTION CONTAINING NITRIC ACID

William Percy Moore, Hopewell, Va., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 11, 1975, Ser. No. 603,829
Int. Cl.² B01D *3/38*
U.S. Cl. 260—345.9 **4 Claims**

1. A process for treating an adipic acid bleed stream obtained in the manufacture of adipic acid by oxidizing with nitric acid a mixture of cyclohexanol and cyclohexanone in the presence of a catalyst consisting of a mixture of copper and vanadium salts, said adipic acid bleed stream consisting mainly of nitric, adipic, glutaric, and succinic acids and said catalyst; the process comprising:

a. recovering a portion of the adipic acid from the adipic acid bleed stream by chilling the adipic acid bleed stream to precipitate adipic acid and separating the precipitated adipic acid from the residual adipic acid bleed stream;

b. dissolving said precipitated adipic acid in aqueous nitric acid to produce a solution which is recycled to said manufacture of adipic acid;

c. maintaining said residual adipic acid bleed stream in aqueous solution by addition of water as required, and stripping nitric acid from said aqueous solution at about atmospheric pressure with steam at a temperature of about 100° to 110° C. while maintaining in said aqueous solution at least 10–25 weight percent of water and a water to nitric acid weight ratio of at least 6, to remove substantially all of the nitric acid therefrom, thereby forming an aqueous nitric acid free mixture of said dibasic acids and said catalyst, which can be safely dehydrated and distilled to produce useful chemicals.

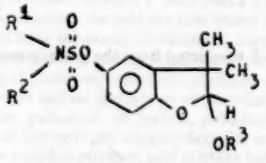
4. The process of claim 1 wherein the aqueous nitric acid free mixture of dibasic acids obtained from said stripping step is dehydrated to form succinic anhydride and glutaric anhydride, and said anhydrides are batch distilled at subatmospheric pressure.

4,014,904
SUBSTITUTED DIHYDRO BENZOFURANYL ESTERS

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, administratrix); Wolfgang Rohr, Mannheim, and Christian Reitel, Ziegelhausen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 20, 1974, Ser. No. 534,680
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 20, 1976
Int. Cl.² C07D *307/83*
U.S. Cl. 260—346.2 R **12 Claims**

1. A compound of the formula



wherein:

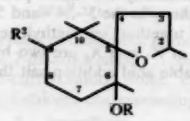
R^1 denotes hydrogen, unsubstituted or chloro- or methoxy-substituted alkyl of 1–4 carbon atoms, allyl, methallyl, propargyl or butynyl;

4,014,905
ESTERS OF CERTAIN TETRAMETHYL AND PENTAMETHYL-1-OXA-SPIRO [4-5] DECAN-6-OLS WITH CERTAIN ALKANOIC ACIDS

Werner Skorianetz, Geneva; Walter Renold, Onex; Gunther Ohloff, Bernex, and Karl-Heinrich Schulte-Elte, Onew, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Oct. 23, 1975, Ser. No. 625,452
Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; June 7, 1974, 7776/74; July 30, 1975, 9920/75
Int. Cl.² C07D *307/94*
U.S. Cl. 260—347.4 **7 Claims**

1. A spirane derivative of formula



(I)

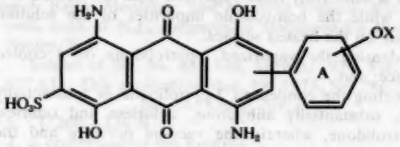
wherein the symbol R represents an alkanoyl radical containing from 1 to 6 carbon atoms and R^2 represents a hydrogen atom or a methyl radical.

4,014,906
PROCESS FOR THE MANUFACTURE OF ANTHRAQUINONE COMPOUNDS

Urs Karlen, Magden, and Hans Morawietz, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

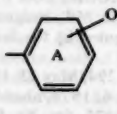
Filed Dec. 10, 1975, Ser. No. 639,935
Claims priority, application Switzerland, Dec. 20, 1974, 17034/74
Int. Cl.² C09B *1/52*
U.S. Cl. 260—373 **9 Claims**

1. A process for the manufacture of anthraquinone compounds of formula

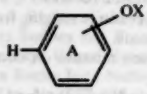


(I)

wherein X represents a hydrogen atom or a substituted or unsubstituted lower alkyl radical of 1 to 6 carbon atoms or a substituted or unsubstituted aryl radical, and the ring A can be further substituted, by sulphonating 1,5-dialkoxy-, 1,5-dicycloalkoxy- or diaryloxy-anthraquinone in the 2 and 6 positions, introducing two amino groups in positions 4 and 8 by treating the sulphonated intermediate with hydroxylamine or a salt thereof in sulphuric acid medium, in the presence of a metal catalyst, introducing the radical



by reacting the boric acid complex of 1,5-dihydroxy-4,8-diaminoanthraquinone-2,6-disulphonic acid with a compound of formula



(II)

saponifying the boric acid groups and splitting off a SO_3H group, which process comprises using 1,5-dialkoxy-, 1,5-dicycloalkoxy- or 1,5-diaryloxyanthraquinone as starting compounds and reacting them to give the end product of formula I.

4,014,907
2-HYDROXY-3-NITRO-1,4-NAPHTHOQUINONES

Barry Christian Charles Cantello; Derek Richard Buckle, both of Redhill, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, England

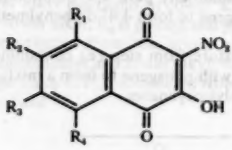
Filed Apr. 24, 1975, Ser. No. 571,253

Claims priority, application United Kingdom, May 28, 1974, 23563/74

Int. Cl.² C07C *49/62, 49/66*

U.S. Cl. 260—396 R **11 Claims**

1. A compound of the formula:



(I)

or a pharmaceutically acceptable salt thereof, wherein R_1, R_2, R_3 and R_4 are each hydrogen, lower alkyl, lower alkoxy, phenyl, hydroxy, or halogen, or any adjacent two of R_1, R_2, R_3 and R_4 taken together with the carbon atoms to which they are joined form a 5- or 6-membered carbocyclic ring, provided that R_1, R_2, R_3 and R_4 are not all hydrogen.

4,014,908
CHEMICAL PROCESS

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Continuation-in-part of Ser. No. 474,735, May 30, 1974, abandoned, which is a continuation of Ser. No. 467,710, May 7, 1974, abandoned, and a continuation-in-part of Ser. No. 417,170, Nov. 19, 1973, Pat. No. 3,919,266, and a continuation-in-part of Ser. No. 290,910, Sept. 21, 1972, abandoned. This application Feb. 20, 1976, Ser. No. 660,037

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.1 **19 Claims**

1. The method of obtaining organic solvent free 3α, 7α-dihydroxy - 5β - cholanic acid from a clathrate consisting of a needle like, crystalline inclusion complex of 3α, 7α-dihydroxy - 5β -cholanic acid and an organic solvent of crystallization included compound, which method comprises:

a. Treating the said clathrate with an alkali metal base to obtain complete dissolution of said clathrate and to yield a solution having a pH of from about 9 to 11;

b. Treating said resultant solution with a mineral acid to yield a solution having a pH of from about 1 to 3; and

c. Recovering the resultant organic solvent-free 3α, 7α-dihydroxy - 5β-cholanic acid,

4,014,909
ESTERS OF 21-THIOL STEROIDS

Dieran Robert Torossian, Bourg-La-Reine; Gilbert Gustave Aubard, Palaiseau, and Jacky Marcel Gerard Legeai, Antony, all of France, assignors to Jouveinal S.A., Cachan, France

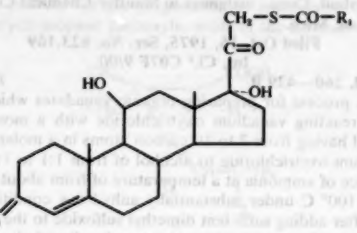
Filed May 28, 1974, Ser. No. 473,388

Claims priority, application France, May 30, 1974, 73.19734

Int. Cl.² C07J *31/00*

U.S. Cl. 260—397.45 **4 Claims**

1. As a new compound a hydrocortisone derivative of the general formula:



wherein:

R_1 is an alkyl radical having 4 or 6 carbon atoms or is the p-fluorophenyl radical.

4,014,910
PROCESS FOR THE PREPARATION OF AN (AR)ALKANE CARBOXYLIC ACID

Willem J. de Klein, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 382,165, July 24, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,322

Claims priority, application Netherlands, Aug. 1, 1972, 7210545

Int. Cl.² C07C *51/00, 53/22, 63/00*

U.S. Cl. 260—413 **12 Claims**

1. In a process for the preparation of a carboxylic acid through hydrolysis of the product, obtained by reaction under inert conditions and in the presence of a trivalent manganese compound, of an ethylenically unsaturated hydrocarbon compound with a carbonyl compound having at least one hydrogen atom attached to an alpha-carbon atom, the improvements comprising:

a. using for the carbonyl compound a member selected from the group consisting of a lower carboxylic anhydride and a mixture of a lower carboxylic anhydride and a lower carboxylic acid wherein the acid is present in an amount up to 40% by weight,

b. employing the trivalent manganese compound in an amount of 10^{-3} to 10^{-10} moles/liter, and

c. maintaining the concentration of the ethylenically unsaturated hydrocarbon below 0.1 mole/liter.

10. The process of claim 1 wherein the anhydride is acetic anhydride.

4,014,911
METHOD FOR PREPARING ETHYL VANADATE

Ronald L. Muntz, Bedford Hills, N.Y., and Robert W. Lerner, Trumbull, Conn., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Oct. 16, 1975, Ser. No. 623,170

Int. Cl.² C07F *9/00*

U.S. Cl. 260—429 R **5 Claims**

1. An improved method for preparing ethyl vanadate by reacting under substantially anhydrous conditions vanadium oxytrichloride with ethanol in a mole ratio of vanadium oxytri-

chloride to ethanol of from 1:1 to 1:6 and at a temperature of from about 0° to about 80° C in the presence of ammonia, the improvement which comprises conducting the reaction in the presence of an inert hydrocarbon solvent and thereafter adding an amide selected from the class consisting of formamide and methyl formamide in a weight ratio of amide to vanadium oxytrichloriide of at least 1.5:1, said hydrocarbon solvent is immiscible with the amide and is a nonsolvent for the ammonium chloride.

4,014,912

METHOD FOR PREPARING ORGANIC VANADATES

Ronald L. Muntz, Bedford Hills, N.Y., and Robert W. Lerner, Trumbull, Conn., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Oct. 16, 1975, Ser. No. 623,169
Int. Cl.² C07F 9/00
U.S. Cl. 260—429 R **8 Claims**

1. A process for preparing organic vanadates which comprises reacting vanadium oxytrichloride with a monohydric alcohol having from 2 to 10 carbon atoms in a molar ratio of vanadium oxytrichloride to alcohol of from 1:1 to 1:5 in the presence of ammonia at a temperature of from about 0° up to about 100° C under substantially anhydrous conditions and thereafter adding sufficient dimethyl sulfoxide to the reaction mixture to form a vanadate phase and a dimethyl sulfoxide-ammonium chloride phase and thereafter recovering the organic vanadate.

4,014,913

PROCESS FOR PRODUCING OXYGENATED TWO CARBON COMPOUNDS

Paul Clifford Ellgen, St. Albans, and Madan Mohan Bhasin, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,717
Int. Cl.² C07C 27/06
U.S. Cl. 260—449 R **5 Claims**

1. The process for selectively producing oxygenated hydrocarbon products of two-carbon atoms from a gaseous mixture containing carbon monoxide and hydrogen wherein said gaseous mixture is continuously contacted with a solid catalyst comprising a combination of rhodium and manganese at reaction conditions correlated to achieve such product in efficiencies, based on carbon consumption, in excess of 10% and obtain the formation of acetic acid, ethanol, and/or acetaldehyde in an amount which is at least about 50 weight percent of the two or more carbon atom compounds obtained by the reaction, which reaction conditions include a temperature within the range of about 150°–450° C, and a pressure within the range of about 15–10,000 psig and wherein the mole ratio of manganese to rhodium in the catalyst is not less than 1:1000.

4,014,914

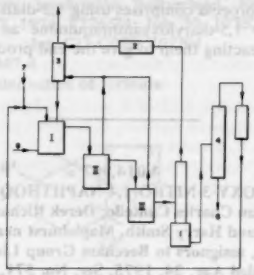
MANUFACTURE OF 4,4'-DIPHENYLMETHANE DIISOCYANATE AND A MIXTURE OF DIISOCYANATES AND POLYISOCYANATES

Hans Joachim Pistor, Walldorf; Herwig Hoffmann, Frankenthal; Hans-Ingo Joschek, Mannheim, and Gotthilf Wenner, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 2,123, Jan. 12, 1970, abandoned.
This application Oct. 25, 1974, Ser. No. 518,076
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² C07C 119/02
U.S. Cl. 260—453 PH **6 Claims**

1. A process for the manufacture of 4.4'-diphenylmethane diisocyanate and a mixture of diisocyanates and polyisocyanates which consists essentially of

a. condensing aniline with formaldehyde in a molar ratio of from 2:1 to 6:1 in the presence of a strong aqueous mineral acid at temperatures of 10° to 90°C at the start of the reaction rising to temperatures ranging from 80° to 150°C as condensation proceeds;
b. neutralizing the reaction mixture on completion of condensation;
c. distilling off from the mixture obtained after neutralization all or a portion of the diamines;



d. recovering substantially pure 4,4'-diaminodiphenylmethane from the mixture of separated diamines by crystallization from a solvent;
e. combining the distillation residue from step (c) and the mother liquor from step (d);
f. reacting the substantially pure 4,4'-diaminodiphenylmethane with phosgene to form 4,4'-diphenylmethane diisocyanate; and
g. reacting the mixture from step (e) containing diamines and polyamines with phosgene to form a mixture of diisocyanates and polyisocyanates.

4,014,915

OXIME CARBONATES

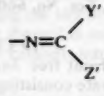
Masumi Itoh, Takatsuki, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 26, 1975, Ser. No. 607,758
Claims priority, application United Kingdom, Apr. 22, 1975, 16707/75
Int. Cl.² C07C 69/96
U.S. Cl. 260—463 **24 Claims**

1. Carbonic acid esters of the formula:

$$R'_1OCOOR'_2$$

ps wherein R'_1 is lower alkyl which may have substituents selected from the group consisting of halogen, lower alkoxy and aryloxy, or ar(lower) alkyl which may have substituents selected from the group consisting of lower alkoxy, halogen, nitro and cyano, and R'_2 is a group represented by the formula:



wherein Y' is selected from the group consisting of cyano, nitro, carbamoyl, esterified carboxy, lower alkanoyl, aroyl, di-substituted carbamoyl, or aryl which may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo(lower)alkyl and Z' is aryl which may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo(lower)alkyl; provided that when R'_1 is lower alkyl, Y' is cyano, and Z' is aryl, the number of carbon atoms of lower alkyl for R'_1 is 4 or 5.

4,014,916

INTERMEDIATES IN THE PRODUCTION OF TRICYCLIC BENZODIAZEPINES

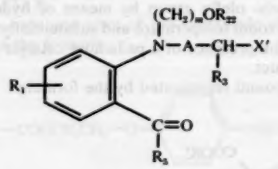
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,956, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 676,091

Int. Cl.² C07C 69/96

U.S. Cl. 260—463 1 Claim

1. Compounds of the formula



wherein R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_3 is the group —COO— lower alkyl; R_5 is phenyl and phenyl substituted with a member selected from the group consisting of halogen, nitro, trifluoromethyl and lower alkyl; R_{22} is carbobenzoxy; *m* is an integer from 1–7; A is selected from the group consisting of $—CH_2—$ and

and X′ is chlorine, bromine or iodine.

4,014,917

AMINOMETHYLENEMALONITRILES

Peter Laurence Carter, Bishop's Stortford, England, assignor to Fisons Limited, England

Filed Oct. 3, 1973, Ser. No. 403,076

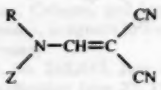
Claims priority, application United Kingdom, Oct. 6, 1972, 46180/72

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C07C 121/78

U.S. Cl. 260—465 E 8 Claims

1. An aminomethylenemalononitrile compound of the formula



(I)

in which R represents phenyl; naphthyl; phenyl or naphthyl substituted by one or more substituents selected from halogen, alkyl of 1–4 carbon atoms and alkoxy of 1–4 carbon atoms; phenylalkyl; or phenylalkyl whose phenyl group is substituted by one or more substituents selected from halogen and alkyl of 1–4 carbon atoms; and Z represents trichloromethylthio or dichlorofluoromethylthio.

4,014,918

PROCESS FOR THE PREPARATION OF CYCLOPROPANE DERIVATIVES AND COMPOUNDS PRODUCED THEREIN

Jacques Martel, Bondy, France, assignor to Roussel-UCLAF, Paris, France

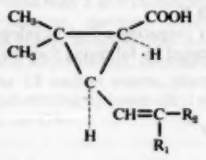
Continuation of Ser. No. 237,892, March 24, 1972, abandoned, which is a continuation of Ser. No. 841,132, July 11, 1969, abandoned. This application Sept. 23, 1975, Ser. No. 616,048

Claims priority, application France, July 12, 1968, 68.159066

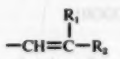
Int. Cl.² C07C 51/00

U.S. Cl. 260—468 H 4 Claims

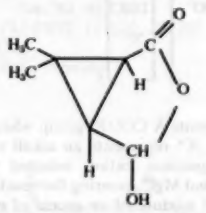
1. A process for the preparation of racemic or optically active cyclopropane carboxylic acids of the formula



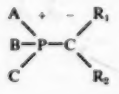
wherein the COOH on the 1-carbon and the



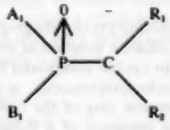
on the two carbon are cis relative to each other and R_1 and R_2 are selected from the group consisting of ethyl and methyl or R_1 is methyl and R_2 is methoxy carbonyl or R_1 and R_2 together with the carbon atom to which they are attached form a cyclopentyl comprising submitting the internal hemiacylal of racemic or optically active cis 3,3-dimethyl-2-formyl-cyclopropane-1-carboxylic acid of the formula



in the presence of an organic solvent to the action of a phosphorus reagent selected from the group consisting of an ylide of the formula



in the presence of an alkali metal hydride and a carbanion of the formula



wherein A, B, and C are selected from the group consisting of phenyl, dialkylamino and dialkylamino diaryl, A_1 and B_1 are selected from the group consisting of phenyl, dialkylamino and alkoxy and R_1 and R_2 have the above meaning in the presence of an alkali metal amide or alkali metal alcoholate to form the corresponding racemic or optically active cyclopropane carboxylic acid.

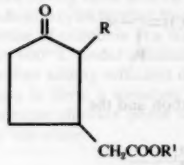
4,014,919

PROCESS FOR PREPARING METHYL JASMONATE AND RELATED COMPOUNDS

Francis Johnson, Setauket, N.Y.; Kenneth G. Paul, West Newton, Mass., and Duccio Favara, Como, Italy, assignors to The Dow Chemical Company, Midland, Mich.

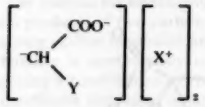
Filed Mar. 1, 1974, Ser. No. 447,101
Int. Cl.² C07C *69/74, 67/30*
U.S. Cl. 260—468 K **3 Claims**

1. A process for preparing a 3-oxo-cyclopentaneacetic acid derivative represented by following formula I

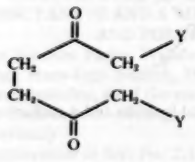


I

wherein R represents an alkenyl radical of 4 to 6 carbon atoms wherein the unsaturation is in the 2-, 3- or 4-position and R^1 is methyl or ethyl, which comprises the following steps: (A) mixing at a temperature between about −30° and +30° C in an inert organic solvent substantially one molar proportion of a succinoyl halide with substantially four molar proportions of a salt represented by the formula

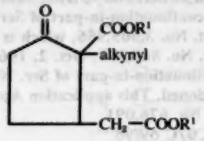


wherein Y represents A $COOR^1$ group wherein R^1 represents methyl or ethyl, X^+ represents an alkali metal cation or a monovalent magnesium cation selected from the group $MgBR^+$, $MgCl^+$ and MgI^+, pouring the reaction mixture into a vigorously stirred mixture of an excess of concentrated mineral acid, ice and water, separating the organic layer, washing it free of excess mineral acid with aqueous concentrated alkali metal bicarbonate and drying and recovering the said reaction product, a diketo compound represented by following formula II



II

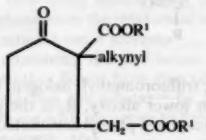
wherein Y has the meaning previously given; (B) mixing compound II in aqueous alkaline medium at about 0° to 30° C for about 0.5 to 2 hours to cyclize compound II to form the corresponding 3-oxo-1-cyclopenteneacetic acid derivative; (C) reducing the cyclopentene ring of the last-named compound with hydrogen in the presence of a noble metal or a noble metal oxide as the catalyst to give the corresponding cyclopentane derivative; (D) alkylating the so-obtained 3-oxo-cyclopentaneacetic acid derivative at position 2 with a compound of the formula alkynyl-X wherein "alkynyl" represents a C_4–C_6 aliphatic chain containing a triple bond in the 2-, 3- or 4- position and X represents a leaving group selected from Cl, Br, ONO_2, tosylate and mesylate, to give a compound of following formula V



V

wherein R^1 and alkynyl have the meaning previously given; (E) eliminating the $COOR^1$ group at position 2 of the cyclopentanone ring; and (F) selectively hydrogenating the alkynyl group to a cis- olefin group by means of hydrogen gas at substantially room temperature and substantially atmospheric pressure in the presence of a palladium catalyst and recovering the product.

2. A compound represented by the formula



wherein R^1 represents methyl or ethyl and alkynyl represents a C_4 to C_6 aliphatic radical containing a triple bond in the 2-, 3- or 4- position.

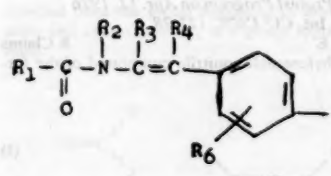
4,014,920

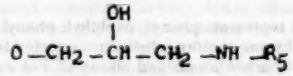
N-CINNAMYLCARBAMIC ACID ESTERS

Knut Alfred Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schroter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 4, 1973, Ser. No. 367,092
Claims priority, application Switzerland, June 8, 1972, 8505/72; Apr. 18, 1973, 5634/73
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **13 Claims**

1. Amines of the formula I





(I)

wherein R_1 is lower alkoxy, R_2 is hydrogen or lower alkyl, R_3 is hydrogen, lower alkyl, carboxyl or lower alkoxycarbonyl, R_4

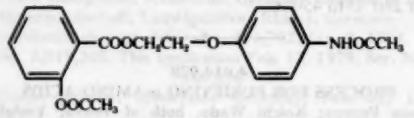
is hydrogen or lower alkyl, R_3 is lower alkyl, phenyl optionally substituted by lower alkyl, lower alkoxy, halo or trifluoromethyl, carboxy-lower alkyl esterified with an aliphatic alcohol, carbamoyl-lower alkyl, N-mono-lower alkyl carbamoyl-lower alkyl, or N,N-di-lower alkyl carbamoyl-lower alkyl, and R_4 denotes halogen, trifluoromethyl, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkoxymethyl, carbamoyl, N-lower alkylcarbamoyl, lower alkinyloxy or hydrogen, and therapeutically acceptable acid addition salts thereof.

4,014,921
O-ACETOXY BENZOATE ESTER OF 2(p-ACETAMIDO-PHENYLOXY)ETHYL ALCOHOL

Carlos Sunkel Letelier, and Fernando Cillero Grafulia, both of Madrid, Spain, assignors to Alter, S.A., Spain

Filed Aug. 15, 1975, Ser. No. 605,090
Claims priority, application Spain, July 11, 1975, 439340
Int. Cl.² C07C *69/66*
U.S. Cl. 260—473 R **1 Claim**

1. O-acetoxy benzoate ester of 2(p-acetamido-phenyloxy)-ethyl alcohol of the formula

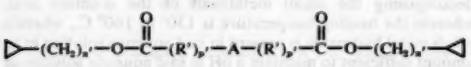


4,014,922
ORGANIC COMPOSITIONS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 489,279, July 17, 1974, Pat. No. 3,948,961. This application July 25, 1975, Ser. No. 599,207
Int. Cl.² C07C *69/76, 69/82*
U.S. Cl. 260—475 R **5 Claims**

1. A compound selected from the formula:



wherein,

n' is the odd integer 3, 5, 7 or 9;

R' is alkylene of one to six carbon atoms or alkenylene of two to six carbon atoms;

p' is zero or one; and

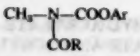
A is arylene of six to 20 carbon atoms, optionally substituted by one or two groups selected from alkyl of one to 20 carbon atoms, halogen or nitro.

4,014,923
N-CARBOXYLATED N-METHYLCARBAMIC ACID ARYL ESTERS

Engelbert Kühle, Bergisch-Gladbach; Peter Siegle, Cologne; Wolfgang Behrenz, Cologne, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 265,843, June 23, 1972, Pat. No. 3,857,860. This application June 27, 1974, Ser. No. 483,746
Claims priority, application Germany, July 2, 1971, 2132936
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² C07C *125/06*
U.S. Cl. 260—479 C **4 Claims**

1. An N-carboxylated N-methylcarbamic acid aryl ester of the formula



in which

Ar is phenyl, naphthyl, or phenyl or naphthyl substituted one or more times by a lower alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkylmercapto, alkenylmercapto or alkynylmercapto each of up to 4 carbon atoms, or by dimethylamino, trifluoromethyl, chlorine, bromine, fluorine nitro, cyano, cycloalkyl of 5 or 6 ring carbon atoms substituted with lower alkyl of 1 to 4 carbon atoms, or by N,N-dimethyl- or N,N-diethylformamidino, or by a lower dialkoxymethyl radical; and

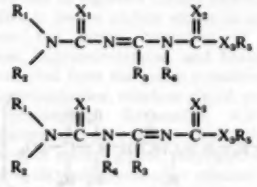
R is optionally substituted lower alkoxy, alkenoxy, alkynoxy or alkylmercapto each with 1 to 4 carbon atoms, or anilino, chloranilino, nitroanilino, methoxy anilino, or $—NR'_2$ wherein R′ is individually selected from the group consisting of hydrogen and alkyl, alkenyl, cycloalkyl or cycloalkenyl each of up to 12 carbon atoms, phenylmercapto or phenylmercapto substituted by lower alkyl of 1 to 4 carbon atoms or chlorine, or OAr.

4,014,924
ALKYL-4-ALKYL-N-ALKOXYCARBONYL-1-THIOALLOPHANIMIDATE

Julius J. Fuchs, Wilmington, and Kang Lin, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 325,357, Jan. 26, 1973, Pat. No. 3,959,331, which is a continuation-in-part of Ser. No. 181,201, Sept. 16, 1971, abandoned. This application Feb. 27, 1976, Ser. No. 662,002
Int. Cl.² C07C *127/00, 155/08*
U.S. Cl. 260—481 C **6 Claims**

1. A compound of the formula



where

X_1, X_2 and X_3 are oxygen;

R_1 is hydrogen;

R_2 is alkyl of 1 through 6 carbon atoms, cycloalkyl of 3 through 8 carbon atoms, cycloalkylalkyl of 4 through 7 carbon atoms, alkenyl of 3 through 4 carbon atoms or alkynyl of 3 through 4 carbons;

R_3 is SR_4 or OR_4;

R_4 is methyl or ethyl;

R_5 is methyl or ethyl; and

R_6 is hydrogen or methyl.

4,014,925

PROCESS FOR PREPARING METHYL ACRYLATE OR MIXTURES OF METHYL ACRYLATE AND ACRYLIC ACID

Natale Ferlazzo, Segrate (Milan); Gian Fausto Buzzi, Arona (Novara); Marcello Ghirga, Bresso (Milan), and Benedetto Calcagno, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 5, 1974, Ser. No. 521,016
Claims priority, application Italy, Nov. 28, 1973, 31746/73
Int. Cl.² C07C *69/54*
U.S. Cl. 260—486 R 16 Claims

1. A method for preparing methyl acrylate or a mixture of methyl acrylate and acrylic acid by contacting acrolein, methnol and oxygen with a catalyst, which comprises continuously delivering said methanol in part at the bottom of a bed of the fluidized catalyst as a gaseous mixture with a gaseous flow comprising said acrolein and oxygen and in part at at least one intermediate point between the top and bottom of the fluidized catalyst bed, said catalyst being selected from the group consisting of compounds defined by the following formulae:

$Mo_aV_bMe_cO_x$

$Mo_aW_dMe_cO_y$

$Mo_aV_bW_dMe_cO_z$

wherein Me is an element selected from the group consisting of chromium, manganese, iron, cobalt, nickel, copper, zinc, silver, cadmium, gold, mercury, sodium, barium, calcium, cerium, bismuth, thorium, uranium, lead, antimony, tin, phosphorus and boron; and wherein *a*, *b*, *c*, *d*, *x*, *y*, *z* are respectively: *a* from 6 to 12, *b* from 1 to 6, *c* from 0 to 5, *d* from 1 to 6, *x* from 20.5 to 58.5, *y* from 21 to 61.5 and *z* from 23.5 to 76.5.

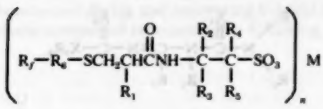
4,014,926

FLUORINATED SULFONIC ACIDS AND DERIVATIVES THEREOF

Robert Ernest Arthur Dear, Mount Kisco, and Eduard Karl Kleiner, New York, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,271
Int. Cl.² C07C *143/08*
U.S. Cl. 260—513 N 9 Claims

1. A compound of the formula



wherein

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbons,

R_1 is hydrogen or lower alkyl,

R_2, R_4 and R_5 are independently hydrogen or alkyl group of 1 to 12 carbons,

R_3 is hydrogen or alkyl of 1 to 12 carbons,

R_6 is a straight or branched chain alkylene of 1 to 12 carbons, and

M is hydrogen, a monovalent alkali metal or an alkaline earth metal, and

n is an integer corresponding to the valency of M.

4,014,927

PROCESS FOR PRODUCTION OF UNSATURATED ACIDS FROM CORRESPONDING UNSATURATED ALDEHYDES

Koju Kadowaki, Ami, Japan, assignor to Mitsubishi Petrochemical Company Limited, Japan

Filed Aug. 31, 1973, Ser. No. 393,469
Claims priority, application Japan, Sept. 7, 1972, 47-89921; Dec. 5, 1972, 47-121876; July 5, 1973, 48-75886
Int. Cl.² C07C *51/32*
U.S. Cl. 260—530 N 3 Claims

1. A process for the production of unsaturated acids by the vapor-phase catalytic oxidation of the corresponding unsaturated aldehyde selected from the group consisting of acrolein and methacrolein at a temperature of 200°–400° C. in the presence of a catalyst consisting essentially of molybdenum vanadium, iron silicon, element X and oxygen represented by the formula

$(Mo)_{12}(V)_{0.5-6}(Fe)_{0.25-5}(Si)_{0.2-24}(X)_{0.2}(O)_{36-116}$

wherein X is at least one element selected from the group consisting of Na, K and Rb, and has a specific surface of 0.1 m^2/g to 8 m^2/g, and the catalyst is prepared by drying a homogenous aqueous solution or slurry mixture of the catalyst-raw-materials by evaporation to dryness or spray drying and calcining the dried product thus obtained at a temperature of from 280° C to 450° C.

4,014,928

PROCESS FOR PURIFYING α-AMINO ACIDS

Osamu Furuya; Koichi Wada, both of Tokyo; Yoshihiko Hosaki, Yokohama, and Nobutake Mihara, Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,859
Claims priority, application Japan, Aug. 8, 1974, 49-90231
Int. Cl.² C07C *99/12*
U.S. Cl. 260—534 R 8 Claims

1. A process for purifying a synthesized α-amino acid containing cyano impurities which comprises heating an aqueous solution of the α-amino acid in the form of its alkali metal salt in the presence of an alkali metal hydroxide to decompose the cyano impurities present in the aqueous solution without decomposing the alkali metal salt of the α-amino acid, wherein the heating temperature is 130° to 160° C., wherein alkali metal hydroxide is present in said aqueous solution in an amount sufficient to maintain a pH in said aqueous solution of at least 13.5, and wherein said synthesized α-amino acid is produced by aminating a cyanohydrin with ammonia to form the corresponding α-aminonitrile, converting the α-aminonitrile to an alkali metal salt of the corresponding α-amino acid by alkaline hydrolysis and finally neutralizing the salt with an acid to form the corresponding free α-amino acid.

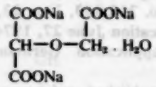
4,014,929

ETHER CARBOXYLATE MONOHYDRATE

Norman Earl Stahlheber, Columbia, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 17, 1975, Ser. No. 632,347
Int. Cl.² C07C *59/23*
U.S. Cl. 260—535 P 5 Claims

1. A compound represented by the formula:



and characterized by an X-ray diffraction pattern exhibiting strong diffraction lines corresponding to the approximate values of interplanar spacing *d*: 8.14 A, 5.65 A, 5.45 A, 5.24 A, 4.50 A, 4.35 A, 3.42 A, 2.77 A, 2.59 A, and 2.38 A.

4,014,930

CARBOXY METHOXY MALONATE

William A. Feller, Kirkwood, Mo., and Norman Earl Stahlheber, Columbia, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 468,713, May 10, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,793
Int. Cl.² C07C 59/23
U.S. Cl. 260—535 P 2 Claims

1. A crystalline hydrate of trisodium carboxy methoxy malonate having a copper Kα X-ray diffraction pattern characterized by strong diffraction lines at the approximate values of the angle 2θ: 20.10°, 8.00°, 14.30°, 30.37°, 16.20°, 5.80°, 37.00°, and 10.00°, said values of the angle 2θ corresponding, respectively, to the values of interplanar spacing *d*: 4.414 A, 11.04 A, 6.188 A, 2.941 A, 5.467 A, 15.22 A, 2.428 A, and 8.838 A.

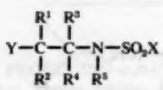
4,014,931

PRODUCTION OF β-HALOALKYLAMINOSULFONYL HALIDES

Gerhard Hamprecht, Mannheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 431,702, Jan. 8, 1974, Pat. No. 3,919,308. This application Feb. 13, 1975, Ser. No. 549,658
Claims priority, application Germany, Feb. 22, 1974, 2408530
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.² C07C 143/155, 143/21
U.S. Cl. 260—543 R 8 Claims

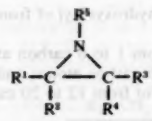
1. A process for the production of a β-haloalkylaminosulfonyl halide of the formula:



(I),

in which the individual radicals R^1, R^2, R^3 and R^4 may be identical or different and each is hydrogen, or an aliphatic, araliphatic or aromatic radical, and R^1 and R^3 and/or R^2 and R^4 together with the two adjacent carbon atoms may form an alicyclic ring, X and Y may be identical or different and each is a chlorine atom or a fluorine atom, and R^5 is an aliphatic radical, which comprises:

reacting an aziridine of the formula



in which R^1, R^2, R^3, R^4 and R^5 have the above meanings, with a sulfuryl halide of the formula

in which X and Y have the above meanings.

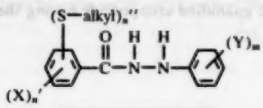
4,014,932

ALKYLTHIO BENZOIC ACID PHENYL-HYDRAZIDES

Girts Kaugars, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 530,085, Dec. 6, 1974, Pat. No. 3,931,318, which is a division of Ser. No. 54,622, July 13, 1970, Pat. No. 3,930,020. This application Aug. 4, 1975, Ser. No. 601,502
Int. Cl.² C07C 109/10
U.S. Cl. 260—558 H 12 Claims

1. The chemical compounds ar or ar' (alkylthio) benzoic acid 2-phenylhydrazides having the structural formula:



wherein "alkyl" is of from 1 to 6 carbon atoms, inclusive; X is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, alkylthio of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl of from 1 to 3 carbon atoms, inclusive, wherein *n* is the integer 2 or 3, and nitro; Y is alkyl of from 1 to 6 carbon atoms, inclusive, halogen, alkylthio of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl of from 1 to 3 carbon atoms, inclusive, and nitro; *n'* is an integer 0 to 3, inclusive; *n''* is 1 except when Y is alkylthio, when it can be zero; and *m* is an integer from 0 to 3, inclusive, the sum of $n' + n'' + m$ being not more than 6, the sum of carbon atoms in the alkyl substituents being not more than 15, there being no more than one nitro group in the molecule, and no more than two α-$F_n$alkyl groups on any benzene ring or three total.

4,014,933

PRODUCTION OF AMINES FROM ALCOHOLS

Guenther Boettger; Hubert Corr, both of Ludwigshafen; Herwig Hoffmann; Herbert Toussaint, both of Frankenthal, and Siegfried Winderl, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 81,144, Oct. 15, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,828
Claims priority, application Germany, Oct. 23, 1969, 1953263
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976
Int. Cl.² C07C 85/02
U.S. Cl. 260—563 R 6 Claims

1. In a process for the production of an amine by reacting an alkanol having one to eighteen carbon atoms; or a cycloalkanol having five to twelve carbon atoms; or an alkanolamine selected from the group consisting of ethanolamine, propanolamine, isopropanolamine, and hexanolamine; or a polyalcohol selected from the group consisting of diethanolamine, diisopropanolamine, ethylene glycol, propylene glycol, butanediol, pentanediol, hexanediol, 4,4'-bishydroxycyclohexyl-propane-(2,2); or a glycol ether selected from the group consisting of methyl glycol, ethyl glycol and butyl glycol; or and a polyalkylene glycol ether selected from the group consisting of polyethylene glycol ether, polypropylene glycol ether, and polybutylene glycol ether, with ammonia or a primary or a secondary amine, the ammonia or amine being present in an excess of from 5 to 50 moles over the stoichiometric amount of alcohol in the presence of hydrogen and a cobalt, nickel and copper-containing aluminum oxide or silicon dioxide supported catalyst at a temperature of from 100° to 200° C and at a pressure of from 10 to 250 atmospheres, the improvement which consists essentially of using a supported catalyst containing, based on the metal content of the catalyst, from 70 to 95% by weight of a mixture of cobalt and nickel and from 5 to 30% by weight of copper, the ratio by weight of cobalt to nickel being from 4:1 to 1:4, the metal content of the catalyst being from 5 to 80% by weight, based on the whole catalyst.

4,014,934
SUBSTITUTED 4'-HYDROXYPHENYL GUANIDINES AND METHODS OF USING THE SAME

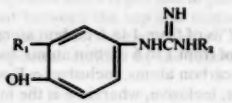
John Lawrence Hughes, and Robert Chung-Huan Liu, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 460,815, April 15, 1974, Pat. No. 3,908,013, which is a division of Ser. No. 73,244, Sept. 17, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,925

Int. Cl.² C07C *129/08*

U.S. Cl. 260—565 2 Claims

1. Aromatic guanidine compounds having the formula



wherein: R_1 is hydroxyl; and R_2 is hydrogen or methyl.

4,014,935
CARBODIIMIDES

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

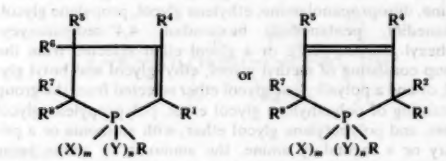
Filed Mar. 25, 1976, Ser. No. 670,155

Claims priority, application United Kingdom, Apr. 3, 1975, 13656/75; Apr. 3, 1975, 13657/75; Apr. 3, 1975, 13658/75; Apr. 3, 1975, 13659/75; Apr. 16, 1975, 15649/75; Oct. 30, 1975, 44965/75

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R 19 Claims

1. A process for the conversion of from 3% to 35% of the isocyanate groups in a refined aromatic polyisocyanate having two or more isocyanate groups, into carbodiimide groups which comprises heating said isocyanate with a catalyst of the formula:



(I) (II)

wherein R is phenyl, benzyl or ethyl, R^1, R^2, R^5, R^6, R^7 and R^8 are hydrogen, R^4 is methyl, X and Y may be chlorine or bromine or X and Y taken together may represent the divalent atoms =O or =S or the divalent radical =N aryl, *m* and *n* represent 0 or 1 and are the same in any one compound, followed by deactivation of the catalyst by adsorption on a substrate or by addition of one or more of the halides of hydrogen, phosphorus or tin or an oxyhalide of phosphorus or sulphur.

4,014,936
ANTIDEPRESSANT 1,1A,6,10B-TETRAHYDRODIBENZO[A,E]-CYCLOPROPA-[C]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES

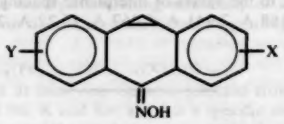
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,277

Int. Cl.² C07C *131/08*

U.S. Cl. 260—566 A 2 Claims

1. A compound of the formula



where

X or Y = H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CH_3S, CH_3SO_2, $SO_2N(CH_3)_2$,

provided that at least one of X or Y is H.

4,014,937
3,4-AND 3,5-DIALKOXYPHENETHYLAMINES

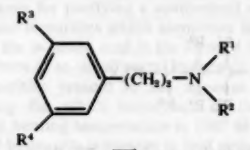
Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 500,377, Aug. 26, 1974, Pat. No. 3,960,958. This application Mar. 11, 1976, Ser. No. 666,079

Int. Cl.² C07C *87/28*

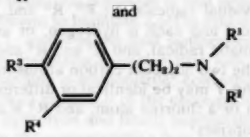
U.S. Cl. 260—570.8 R 7 Claims

1. A compound selected from those of the formulae:



I

and



II

and the pharamaceutically acceptable acid addition salts thereof, wherein

R^1 is hydrogen, methyl or hydroxyalkyl of from 2 to 6 carbon atoms;

R^2 is hydrogen, alkyl of from 1 to 6 carbon atoms, or hydroxyalkyl of from 2 to 6 carbon atoms; and

R^3 and R^4 are each alkoxy of from 12 to 20 carbon atoms.

4,014,938
4-TRICYCLO[5,2,1,0^{2,6}]DECYL-8-BUTANAL

Theodor Leidig, Holzminden, Germany, assignor to Haarmann & Reimer GmbH, Holzminden, Germany

Filed Nov. 18, 1974, Ser. No. 524,849

Claims priority, application Germany, Nov. 30, 1973, 2359659

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C *47/30*

U.S. Cl. 260—598 1 Claim

1. 4-Tricyclo [5,2,1,0^{2,6}] decyl-8-butanal.

4,014,939

PROCESS FOR PRODUCING FORMALDEHYDE

Minoru Osugi, and Takako Endo, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan.

Filed June 5, 1975, Ser. No. 584,366
Claims priority, application Japan, June 7, 1974, 49-63984; Dec. 26, 1974, 50-148390
Int. Cl.² C07C *45/16, 47/04*
U.S. Cl. 260—603 R 6 Claims

1. A process for the production of formaldehyde which comprises dehydrogenating methanol in the presence of a catalytically effective amount of a catalyst consisting of copper, zinc and sulfur as catalyst components at a temperature of 500° to 750° C. wherein the atomic ratio of said catalyst components is 1:0.001–0.1:0.001–0.3 for Cu:Zn:S.

4,014,940

PROCESS FOR PREPARING m-PHENOXYBENZYLALCOHOL AND SIDE-CHAIN HALOGENATED m-PHENOXYTOLUENE

Yoshitaka Ume, Toyonaka; Takashi Matsuo; Nobushige Itaya, both of Nishinomiya, and Nobuo Ohno, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 18, 1974, Ser. No. 434,734
Claims priority, application Japan, Jan. 19, 1973, 48-9022; Jan. 25, 1973, 48-10859
Int. Cl.² C07C *41/00*
U.S. Cl. 260—612 R 9 Claims

1. A process for preparing m-phenoxybenzyl, m-phenoxybenzal halides or a mixture thereof which comprises halogenating m-phenoxytoluene with a halogen in the presence of a phosphorus halide in the high temperature region above 220° C.

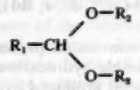
4,014,941

METHOD OF PRODUCING α,β-UNSATURATED ETHER

Kazuaki Tanaka; Yasuto Ishida; Kimiyoshi Yanagi, all of Yokkaichi; Noriaki Kassai, Kameyama, and Toshiyuki Tanaka, Yokkaichi, all of Japan, assignors to Kyowa Yuka Co., Ltd., Japan

Continuation of Ser. No. 203,897, Dec. 1, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,764
Claims priority, application Japan, Dec. 11, 1970, 45-109337
Int. Cl.² C07C *41/00*
U.S. Cl. 260—614 R 13 Claims

1. A method for producing an α,β-ethylenically unsaturated ether comprising decomposing an acetal having the formula:



wherein R_1 is an alkyl group having 1 to 3 carbon atoms and R_2 is an alkyl group having 1 to 4 carbon atoms, at a temperature from 200° to 350° C. in the presence of a catalyst selected from hydrous or anhydrous $Ca_3(PO_4)_2$, $Ca(H_2PO_4)_2$ and $CaHPO_4$ or calcined products thereof either alone or supported on a carrier selected from alumina, asbestos, pumice and unglazed ceramics to produce a reaction product comprising the corresponding α,β-ethylenically unsaturated ether, 0.001 to 1 mol of said acetal being contacted with each gram of catalyst per hour, said catalyst having a size of 2 to 100 mesh.

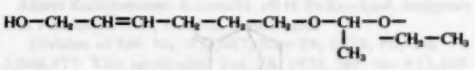
4,014,942

NOVEL ACETAL

Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 602,153, Aug. 6, 1975. This application Mar. 29, 1976, Ser. No. 671,911
Int. Cl.² C07C *43/30*
U.S. Cl. 260—615 A 1 Claim

1. The trans compound of the formula:



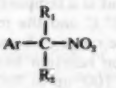
4,014,943

NITROALKANE BASED HINDERED PHENOL COMPOUNDS AND PREPARATION THEREOF

Harry Dounchis, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 475,318, May 31, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,836
Int. Cl.² C07C *77/00, 79/16*
U.S. Cl. 260—619 B 10 Claims

1. A compound selected from the group having the formula



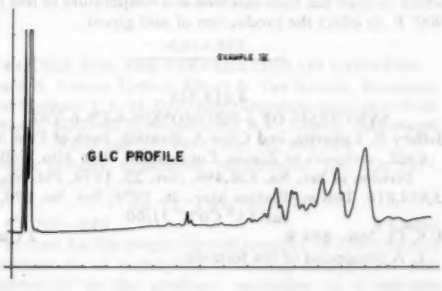
wherein Ar represents a 3,5-di-tertiarybutyl-4-hydroxybenzyl radical and R_1 and R_2 each may represent hydrogen, a lower C_1–C_4 alkyl radical or an Ar radical.

4,014,944

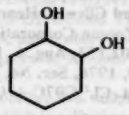
PROCESS AND PRODUCT PRODUCED BY SAID PROCESS

John B. Hall, Rumson, and Wilhelmus Johannes Wiegers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,818
Int. Cl.² C07C *35/00*
U.S. Cl. 260—631.5 2 Claims



1. The product produced by the process which comprises reacting catechol having the structure:



with camphene having the structure:

in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186° up to 236° C and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product, and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C up to 172° C and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluroide-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° up to 175° C and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° up to 300° c, the latter portion of the reaction time being at from 200° up to 300° C.

4,014,945

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

Wilford J. Zimmerschied; David A. Palmer, both of Naperville, Ill., and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,553
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 E **12 Claims**

1. A process for production of ethylene glycol which comprises contacting at reaction conditions a mixture of ethylene oxide and water with a catalyst essentially consisting of aluminum phosphate and containing from about 0.05 to about 10 percent by weight of copper based on aluminum phosphate which catalyst has been calcined at a temperature of less than 900° F. to effect the production of said glycol.

4,014,946

SYNTHESIS OF 1-BROMONON-4-EN-6-YNE

Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 526,496, Nov. 25, 1974, Pat. No. 3,954,818. This application Mar. 26, 1976, Ser. No. 670,774
Int. Cl.² C07C *21/00*
U.S. Cl. 260—654 R **2 Claims**

1. A compound of the formula:

$$CH_3—CH_2—C \equiv C—CH=CH—CH_2—CH_2—CH_2—X$$

wherein X is bromo, iodo or chloro.

4,014,947

METHOD OF PRODUCING VINYL CHLORIDE

Nikolai Lvovich Volodin, Revoljutsionnaya ulitsa, 7, kv. 12, Sterlitamak; Lev Solomonovich Polak, ulitsa Obrucheva, 18, kv. 22, Moscow; Petr Nikolaevich Endjuskin, ulitsa Druzhby, 68, kv. 14, Sterlitamak; Rafail Izrailevich Levenzon, ulitsa Krasikova, 17, kv. 39; Samuil Markovich Krugly, ulitsa Khlobystova, 6, kv. 14, both of Moscow, and Viktor Trofimovich Dyatlov, ulitsa Bljukhera, 2, kv. 78, Sterlitamak, all of U.S.S.R.

Filed May 27, 1970, Ser. No. 40,933
Claims priority, application U.S.S.R., June 3, 1969, 1334597; June 3, 1969, 1334593; June 3, 1969, 1334594
Int. Cl.² C07C *21/02*
U.S. Cl. 260—656 R **1 Claim**

1. A method of producing vinyl chloride, comprising forming a plasma jet of gases consisting essentially of (A) a member selected from the group consisting of hydrogen and a mixture of hydrogen and methane, and (B) a plasma-forming gas selected from the group consisting of chlorine, HCl gas and a mixture of chlorine and HCl gas; pyrolyzing gaseous and liquid hydrocarbons in said plasma jet of gases to form a pyrolysis gas of acetylene, ethylene, HCl gas and higher unsaturated hydrocarbons, the plasma-forming gas being added in such an amount that the content of the HCl gas in the pyrolysis gas is equal to the content of the acetylene in said pyrolysis gas; quenching said pyorlysis gas with liquid hydrocarbons; removing said higher unsaturated hydrocarbons containing at least 3 carbon atoms from said pyrolysis gas; reacting the acetylene with HCl gas to form vinyl chloride; separating the vinyl chloride; reacting the ethylene with chlorine to form dichloroethane; pyrolyzing the dichloroethane to form vinyl chloride and HCl gas; separating said vinyl chloride from said HCl gas; and recycling said HCl gas to the stage of forming said plasma jet.

4,014,948

HYDROCARBON CONVERSION PROCESS UTILIZING GROUP VIII METAL/ALUMINA CATALYSTS ACTIVATED WITH HYDROGEN HALIDE/HALOSILANE/ORGANIC HALIDE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 546,820, Feb. 3, 1975. This application Apr. 30, 1976, Ser. No. 681,933
Int. Cl.² C07C *5/24*; B01J *27/06*
U.S. Cl. 260—666 P **10 Claims**

1. A hydrocarbon conversion process which commprises contacting an isomerizable hydrocarbon under isomerization conditions with a catalyst produced by:

heating an alumina supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst at a temperature within the range of 500° to 1600° F;

contacting said catalyst at said temperature of 500° to 1600° F with a dry activating gas comprising a hydrogen halide selected from the group consisting of HCl and HBr, a halosilane selected from the group consisting of chlorosilanes and bromosilanes, and an organic halide selected from the group consisting of organic chlorides and organic bromides; and

thereafter cooling the thus-contacted catalyst.

4,014,949
SEPARATION OF CYCLIC COMPOUNDS WITH MOLECULAR SIEVE ADSORBENT

John A. Hedge, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 263,372, June 6, 1962, Pat. No. 3,840,610, which is a continuation-in-part of Ser. No. 7,273, Jan. 30, 1970, Pat. No. 3,668,267, and a continuation-in-part of Ser. No. 207,870, Dec. 14, 1971, and a continuation-in-part of Ser. No. 256,863, May 25, 1972, Pat. No. 3,772,399. This application Dec. 19, 1973, Ser. No. 426,274

The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² C07C *7/13*

U.S. Cl. 260—674 SA **5 Claims**

1. A process for separating two structurally similar cyclic hydrocarbons selected from the group consisting of benzene, toluene and xylenes, said process comprising:

A. contacting a fluid feed mixture comprising said cyclic hydrocarbons with a solid adsorbent comprising a partially dehydrated, substantially crystalline alumino-silicate sodium Y zeolite having a critical pore diameter greater than about 6A, the ratio Al/Si of the alumino-silicate framework of the zeolite being in the range of 0.65–0.2, the zeolite having been partially dehydrated to a water content of 6–20 weight percent exposure to a temperature in the range of 80°–300°C., whereby there is obtained a rich adsorbent containing an adsorbate which is richer in one said cyclic hydrocarbon than was said fluid feed mixture, and a raffinate product which contains less of the one said cyclic hydrocarbon than did said fluid feed mixture;

B. separating said raffinate product from said rich adsorbent and,

C. removing the one said cyclic hydrocarbon from said rich adsorbent.

4,014,950
PROCESS FOR THE PURIFICATION OF LIQUID SORBENTS COMPRISING BIMETALLIC SALT COMPLEXES

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed July 2, 1975, Ser. No. 592,564

Int. Cl.² C07C *11/02*

U.S. Cl. 260—677 A **7 Claims**

1. In the process for the separation of olefins having 2 to 4 carbon atoms from a gas feedstream wherein (a) the feedstream is contacted with a liquid sorbent that is a solution in an aromatic hydrocarbon or halogenated aromatic hydrocarbon of a bimetallic salt complex having the formula

$$M_I M_{II} X_n \cdot \text{Aromatic}$$

wherein M_I is a Group I-B metal, M_{II} is a Group III-A metal, X is halogen, n is the sum of the valences of M_I and M_{II}, and Aromatic is a monocyclic aromatic hydrocarbon or halogenated aromatic hydrocarbon having 6 to 12 carbon atoms, thereby forming a reaction mixture that comprises a solution of a complex of the olefin and the bimetallic salt complex in the liquid sorbent, (b) the reaction mixture is separated from the feedstream, (c) the olefin is separated from the liquid sorbent in the reaction mixture, and (d) the liquid sorbent is recycled, the improvement that comprises removing from the liquid sorbent impurities selected from the group consisting of polyalkylated aromatic compounds, olefin oligomers, and mixtures thereof by contacting the liquid sorbent containing impurities with a sorbent-immiscible organic solvent that is a paraffinic hydrocarbon having 5 to 14 carbon atoms in the amount of from 0.1 part to 10 parts by volume of the sorbent-immiscible organic solvent per part by volume of liquid sorbent and thereafter separating a solution of the impurities in the sorbent-immiscible organic solvent from purified liquid sorbent.

4,014,951
PROCESS FOR THE PREPARATION OF POLY-UNSATURATED HYDROCARBONS

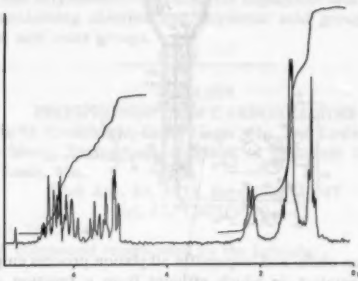
Ferdinand Näf, Geneva; Günther Ohloff, Bernex-Geneva, and Albert Eschenmoser, Kusnacht, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 473,087, May 24, 1974, Pat. No. 3,960,977. This application Jan. 28, 1976, Ser. No. 653,245

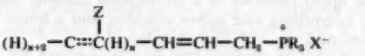
Claims priority, application Switzerland, June 7, 1973, 8247/73

Int. Cl.² C07C *11/21*

U.S. Cl. 260—677 R **10 Claims**



1. Process for the preparation of undeca-1,3trans,5cis-triene and/or undeca-1,3trans,5trans-triene, which comprises reacting a quaternary phosphonium salt of formula



II

wherein symbol R represents an aliphatic, cycloaliphatic or aromatic radical and X represents a halogen atom, such as chlorine, bromine or iodine, or a group such as BF_4 or $C10_4$, and wherein:

a. indedx n stands for 1, Z represents a halogen atom and the dotted lines define a single bond; or

b. index n stands for zero, Z represents a hydrogen atom and the dotted lines define a double bond,

with hexanal, and subsequently separating the pure geometrical isomers.

4,014,952
PROCESS FOR THE PREPARATION OF ISOPRENE

Eduard H. Adema, Geleen; Albert A. Van Geenen, Brunssum, and Marinus J. A. M. Den Otter, Munstergeleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed July 15, 1975, Ser. No. 596,096

Claims priority, application Netherlands, July 22, 1974, 7409855

Int. Cl.² C07C *1/20*

U.S. Cl. 260—681 **6 Claims**

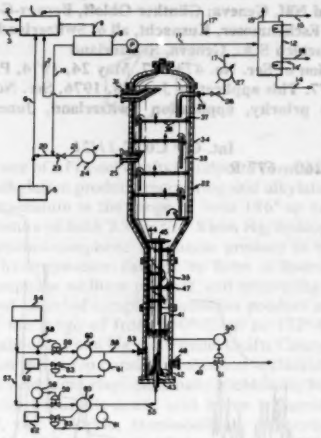
1. Process for the preparation of isoprene by conversion of isobutylene or an isobutylene-containing composition with formaldehyde in the gasphase, according to a one-step method, at temperatures of 150° – 400° C, and in the presence of a catalyst, wherein the catalyst used is a copper-phosphate composition on a carrier.

4,014,953

METHOD FOR PURIFYING HF CATALYST IN AN ISOPARAFFIN-OLEFIN ALKYLATION

Webster W. Brown, Jr., Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 547,261, Feb. 5, 1975, Pat. No. 3,975,164.
This application Apr. 22, 1976, Ser. No. 679,283
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.48 4 Claims



1. In an olefin and isoparaffin alkylation process employing an HF catalyst, in which effluent from a reaction zone is passed to a settling zone to separate an acid stream containing HF and acid soluble oil which stream is then purified by separating the HF and acid soluble oil by a process comprising the steps of:

a. introducing said acid stream into the intermediate region of an upper chamber of a purification column, said column comprising said upper chamber and a lower leg in communication with said chamber;

b. introducing the isoparaffin as a liquid into an upper region of said chamber as a reflux;

c. introducing the first portion of vaporous isoparaffin into said lower region of a leg, said vaporous isoprafffin flowing upwardly through said leg and said upper chamber to strip HF from said acid stream

d. intimately contacting said first portion of vaporous isoparaffin with acid soluble oil collected in said leg;

e. introducing a second portion of said vaporous isoparaffin into an eductor positioned at the bottom of a stand pipe in said leg to provide circulation of acid soluble oil upwardly therethrough and back into said leg;

f. removing a stream containing vaporous isoparaffin and purified HF from the top of said upper chamber; and

g. recovering acid soluble oil substantially free of entrained HF from the lower portion of said leg.

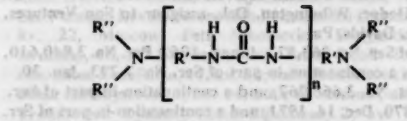
4,014,954

METHOD FOR PREPARING MOLDINGS AND COATINGS

Fritz Gude; Siegfried Brandt; Elmar Wolf, all of Herne, and Johann Obendorf, Dorsten, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed May 30, 1975, Ser. No. 582,534
Claims priority, application Germany, June 21, 1974, 2429765
Int. Cl.² C08L 63/02
U.S. Cl. 260—830 P 6 Claims

4. Molding composition for the manufacture of molded objects and coatings comprising polyadducts of 1,2-epoxy compounds having more than one epoxy group in the molecule and polyureas having the formula

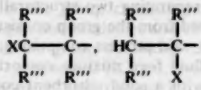


wherein

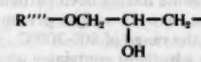
$n \geq 1$,

R′ is an alkylene or arylene radical,

R″ is hydrogen and at least one radical from the group of



and



R‴ being the same or different radical from the group of hydrogen and alkyl, X being an R‴OOC—, R‴₂NOC— or NC— radical and R⁗ being alkyl or aryl.

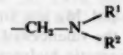
4,014,955

PROCESS FOR THE MANUFACTURE OF POLYETHERS CONTAINING IONIC BONDS

Alfred Renner, Munchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 7, 1974, Ser. No. 440,632
Claims priority, application Switzerland, Feb. 14, 1973, 2087/73
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² C08G 45/08
U.S. Cl. 260—831 18 Claims

1. A process for the manufacture of crosslinked macromolecular polyethers containing ionic bonds, wherein polyhydric mononuclear or polynuclear phenols which contain as substituents, in the o- or p-positions to the OH groups, at least 2 radicals of the formula I



(I)

in which R^1 and R^2 are identical or different and denote a saturated or unsaturated hydrocarbon radical with 1 to 4 carbon atoms or together denote the morpholino radical (Mannich bases) are subjected, optionally in the presence of water or organic solvents, at temperatures of 20° to 200°C

A. on the one hand, to a polyaddition, in a manner which is in itself known, with compounds containing an average of more than one 1,2-epoxide group, the epoxide groups reacting with the phenol groups, and

B. on the other hand, to a polyquaternization, in a manner which is in itself known, with organic compounds containing at least 2 chlorine, bromine or iodine atoms.

4,014,956

THERMOPLASTIC POWDER COATING COMPOSITIONS

Oliver Wendell Smith, South Charleston; Joseph Victor Koleske, Charleston, and Julius John Brezinski, St. Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 353,514, April 23, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,770

Int. Cl.² C08L 27/06

U.S. Cl. 260—853 14 Claims

1. A dry vinyl chloride copolymer powder coating composition suitable for the production of thin films, said powder composition having essentially all of the powder particles ranging in size from 1 micron to 75 mircons and consisting of a mixture of two or more vinyl chloride copolymers that have at least 50 weight percent vinyl chloride polymerized in each copolymer in said mixture, wherein the mixture comprises (a) a positive amount up to 85 weight percent, based on the total weight of copolymers present, of at least one vinyl chloride copolymer having an inherent viscosity up to 0.3 dl/gm with (b) the balance being one or more vinyl chloride copolymers having an inherent viscosity above 0.3 dl/gm, said mixture having an average inherent viscosity of from 0.2 to 0.55 dl/gm.

4,014,957

THERMOPLASTIC POLYAMIDE MOULDING COMPOSITIONS

Günther Kirsch, Frankfurt am Main; Harald Cherdron, Naurod, Taunus, and Walter Herwig, Neuenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 2, 1975, Ser. No. 609,674

Claims priority, application Germany, Sept. 4, 1974, 2442391

Int. Cl.² C08L 77/00

U.S. Cl. 260—857 PG 9 Claims

1. A thermoplastic molding composition consisting essentially of:

A. 99.5 to 80% by weight of an amorphous linear polyamide derived from

α_1. 5 to 50 mole percent of a cycloaliphatic or aromatic aliphatic diamine.

α_2. 0 to 45 mole percent of an aliphatic diamine of 4 to 20 carbon atoms in which the amino groups are separated by at least four carbon atoms,

β_1. 5 to 50 mole percent of an aromatic dicarboxylic acid of 7 to 20 carbon atoms,

β_2. 0 to 45 mole percent of a saturated aliphatic dicarboxylic acid of 6 to 20 carbon atoms, the carboxy groups of which are separated by at least four carbon atoms, and

γ. 0 to 80 mole percent of an aliphatic aminocarboxylic acid of 2 to 20 carbon atoms,

the sum of the mole percent of α_1 and α_2 being equal to the sum of the mole percent of β_1 and β_2,

the sum of the mole percent of components α_1, α_2, β_1, β_2 and γ being 100 mole percent,

the sum of α_1 and β_1 being from 20 to 95 mole percent and the sum of α_2, β_2 and γ being from 5 to 80 mole percent, said polyamide having a second order transition temperature of at least 100° C. and a reduced specific viscosity of 0.7 to 1.8 dl/g, and

B. 0.5 to 20% by weight of at least one segmented thermoplastic elastomeric copolyester comprising

a. long chain ester units derived from a dicarboxylic acid or its equivalent ester-forming derivatives having a molecular weight of less than about 300 and a long chain glycol or its equivalent ester-forming derivative having a molecular weight of more than about 350, and

b. short chain ester units derived from a dicarboxylic acid or its equivalent ester-forming derivatives having a molecular weight of less than about 300 and a low molecular weight diol or its equivalent ester-forming derivatives having a molecular weight of less than about 250,

the ester units being linked head-to-tail by ester linkages and the short chain ester units B) being present to the extent of about 25% to 65% by weight of the copolyester.

4,014,958

DRY-SPUN MODACRYLIC FILAMENTS WITH IMPROVED COLORISTIC PROPERTIES

Ralf Miessen, Dormagen; Günter Blankenstein, Stommeln; Siegfried Korte, Leverkusen, and Carlhans Süling, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 11, 1975, Ser. No. 630,775

Claims priority, application Germany, Nov. 15, 1974, 2454322; May 30, 1975, 2524125

Int. Cl.² C08L 33/20

U.S. Cl. 260—898 5 Claims

1. A dry-spun modacrylic filament with improved coloristic properties and adequate dimensional stability under dyeing conditions based on a polymer mixture, which comprises at least one acrylonitrile-vinyl chloride copolymer and a copolymer containing chlorine and sulphonic acid groups or sulphuric acid ester groups.

4,014,959

PHOSPHONOETHER CARBOXYLATES

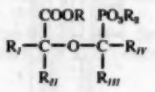
Marvin M. Crutchfield, Creve Coeur, Mo., and Ludwig Maier, Kiechberg, Switzerland, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 24, 1975, Ser. No. 571,347

Int. Cl.² C07C 9/40

U.S. Cl. 260—942 3 Claims

1. A compound represented by the formula:



wherein R is selected from the group consisting of alkyl groups containing from 1 to 4 carbon atoms and benzyl; R_I is selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms, and CH_2COOR; R_{II} is selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms, CH_2COOR and COOR; R_{III} and R_{IV} each are selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms and CH_2COOR; at least one of R_I, R_{II}, R_{III}, and R_{IV} being COOR or CH_2COOR.

4,014,960

CARBURATOR FOR A STRATIFIED COMBUSTION ENGINE WITH A PRECHAMBER

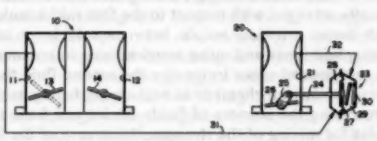
Kenji Goto, and Takao Niwa, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 26, 1975, Ser. No. 553,408

Claims priority, application Japan, Sept. 7, 1974, 49-103340

Int. Cl.³ F02M 11/02

U.S. Cl. 261—23 A 1 Claim



1. A carburetor assembly for use with a stratified combustion engine having a main combustion chamber and a precom-

bustion chamber, said assembly comprising a first body having first and second bores to supply lean gaseous mixture into the main combustion chamber, a second body having a third bore to supply rich gaseous mixture into the precombustion chamber, said second body being separate from said first body and being adapted to be disposed at any desired location spaced from said first body, a throttle valve in said third bore, and an actuator for pivoting said throttle valve, said actuator comprising a closed housing having a diaphragm disposed therein, said diaphragm dividing the interior of said closed housing into two chambers, a first conduit connected to said actuator for introducing a negative pressure in said first bore into one of said chambers so as to deflect said diaphragm in one direction, a second conduit connected to said actuator for introducing a negative pressure in said third bore into the other of the two chambers so as to deflect said diaphragm in the opposite direction, and means connecting said diaphragm to said throttle valve whereby variations in the position of said diaphragm vary the position of said throttle valve in said third bore.

4,014,961

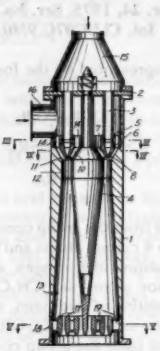
EJECTOR MIXER FOR GASES AND/OR LIQUIDS

Vitaly Fedorovich Popov, ulitsa Gogolya, 4, kv.13, Severodonetsk, Voroshilovgradkoi oblati, U.S.S.R.

Continuation of Ser. No. 354,004, April 24, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,224

Int. Cl.² B05B *7/10*

U.S. Cl. 261—76 **4 Claims**



1. An ejector mixer for fluids comprising a casing, a tube sheet mounted in said casing and dividing the same into first and second spaces, a plurality of vertical distributing tubes having upper ends mounted in said tube sheet around the circumference of a circle, said upper ends of the tubes communicating with said first space, a first inlet for a first fluid communicating with said first spaces to feed said fluid to said tubes, a second inlet for a second fluid communicating with said second space, a pair of coaxial annular rings in said casing defining an annular nozzle, said distributing tubes having lower ends, an annular grid coupled to said lower ends of the distributing tubes and to said annular rings to provide communication between said lower ends of the tubes and said annular nozzle such that the latter receives the first fluid from the tubes, means in said casing forming inner and outer nozzles coaxially arranged with respect to the first said annular nozzle which forms a middle nozzle between said inner and outer nozzles, said inner and outer nozzles being in communication with said second space to receive the second fluid therefrom, an annular mixing chamber in said casing facing said nozzles for receiving the streams of fluids discharged from the three nozzles for mixing of the streams, the stream of the first fluid from the middle nozzle being confined between the streams of the second fluid from the inner and outer nozzles, guide vanes mounted around said annular grid at the inner and outer peripheries thereof for swirling the streams discharged from the first and second nozzles in opposite directions to promote mixing with the stream discharged from the middle nozzle, and a diffuser in said casing coupled to the mixing chamber for receiving the mixed streams therefrom, said diffuser having a discharge end for discharging the mixed streams from the casing.

4,014,962

HEAT AND/OR MASS EXCHANGER OPERATING BY DIRECT CONTACT BETWEEN A LIQUID AND A GAS

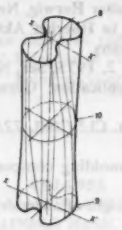
Pedro Perez del Notario, Zamudio (Vizcaya), Spain

Continuation of Ser. No. 342,800, March 19, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,356

Claims priority, application Spain, Mar. 23, 1972, 401117

Int. Cl.² B01F *3/04*

U.S. Cl. 261—112 **4 Claims**



1. Heat and or mass exchanger operating by direct contact between a liquid and a gas comprising a cooling tower including a casing and a filling disposed in said casing through which liquid and gas circulate in direct contact in opposite directions, said filling comprising a plurality of independent and separate tubular elements extending in parallel abutting relation to form a self-supporting cluster in said casing, support means in said casing for said tubular elements including a perforate structure on which said tubular elements directly bear, each element having a cross-section which periodically varies in shape and size along the length thereof in successive wave-lengths, said elements being disposed vertically and extending the entire height of the filling and defining internal and external passages of variable section in shape and size through which both liquid and gas circulate in direct contact, the internal passages being confined within the interior of the tubular elements whereas the external passages are collectively bounded by the external surfaces of the different tubular elements and the inner surface of the casing, said tubular elements being disposed such that the variations in section of the internal and external passages are periodically repeated therealong, the cross-sections of each element for every two consecutive variations in section at half wave-length positions being irregular and turned **90°** relative to one another while the cross-section at the intermediate quarter wave-length positions is regular and gradually undergoes change in shape to said irregular cross-sections at the half wave-length positions, the tubular elements having axial generatrices which are of continuously changing curvature and means at the lower end of each tubular element defining a respective separate dripping point for such element.

4,014,963

MOLDING A PRIMER CHARGE WITHIN A CASELESS PROPELLANT CHARGE

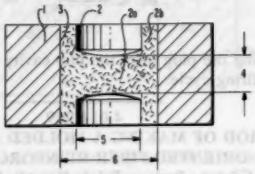
Heinz Gawlick, Furth, Bay, and Guenther Marondel, Erlangen, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Division of Ser. No. 445,896, Feb. 26, 1974, Pat. No. 3,911,825, which is a continuation of Ser. No. 163,173, July 16, 1971, abandoned. This application May 23, 1975, Ser. No. 580,357

Claims priority, application Germany, July 18, 1970, 2035851

Int. Cl.² C06B 21/00

U.S. Cl. 264—3 R 9 Claims



1. A process for making a caseless propellant charge comprising providing a shaped propellant powder charge having a hole therethrough, introducing a percussion-sensitive mixture into said hole and compressing the central portion of said percussion-sensitive mixture on both sides thereof in a manner such that superfluous portions of said mixture are displaced to the periphery of the hole to line the interior of said shaped propellant powder charge whereby a primer charge having an H-shaped cross section is formed in said hole.

4,014,964

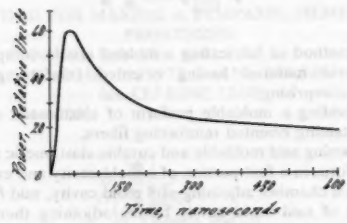
PROCESS FOR MAKING METAL POWDER USING A LASER

Robert L. Probst, Ann Arbor, Mich., and Barry P. Fairand, Columbus, Ohio, assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed July 16, 1975, Ser. No. 596,402

Int. Cl.² B01J 2/02

U.S. Cl. 264—10 9 Claims



1. A process for producing metal powder which comprises the steps of providing a supply of molten metal, introducing said molten metal in the form of a stream having a preselected cross sectional area into a chamber, directing a transversely excited laser beam in impinging relationship against said stream and controlling the pulse rate and power of said laser beam to effect a fragmentation of said stream into a plurality of molten droplets, cooling said droplets to effect a solidification thereof, and recovering the resultant metal powder product.

4,014,965

PROCESS FOR SCRAPLESS FORMING OF PLASTIC ARTICLES

Steven H. Stube, and Douglas S. Chisholm, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 24, 1972, Ser. No. 309,249

Int. Cl.² B06B 3/00

U.S. Cl. 264—23 12 Claims

1. In a process for forming articles from a powder of a thermoplastic resinous polymer wherein the powder in an amount sufficient to produce the article is compressed at a temperature below the melt temperature of the powder into a briquette containing polymer particles and having green strength and the briquette having been maintained at a temperature in the range from about the alpha transition temperature to less than the melt temperature of the polymer for a time sufficient to effect sintering of the polymer particles of the briquette is forged into an article of fused polymer; the improvement which comprises compacting the powder with vibratory energy to form the briquette having a percent compaction of at least about 85 percent.

4,014,966

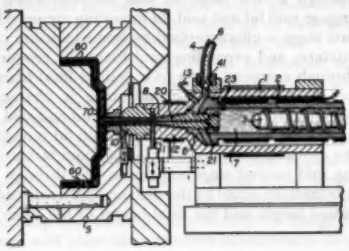
METHOD FOR INJECTION MOLDING A COMPOSITE FOAMED BODY HAVING A FOAMED CORE AND A CONTINUOUS SURFACE LAYER

Robert Hanning, Cavernago Parc 1, Campione d'Italia, Italy

Continuation of Ser. No. 286,733, Sept. 6, 1972, abandoned. This application Nov. 5, 1974, Ser. No. 521,184

Int. Cl.² B29D 27/00; B29F 1/03

U.S. Cl. 264—45.1 1 Claim



1. A method of making a composite synthetic resin body having a foamed core and a continuous surface layer, said method comprising the steps of:

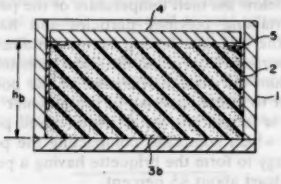
a. injecting into a mold cavity of given volume an initial quantity of a melt of a first synthetic thermoplastic resin material adapted to form surface portions of said body through a passageway surrounding a tube penetrating into said mold cavity for a distance at least equal to the thickness of said layer, said passageway terminating short of the end of said tube penetrating into said mold; and

b. thereafter injecting into said mold cavity through said tube a quantity of a melt of a second synthetic thermoplastic resin material containing an expanding agent to spread said first material along the walls of said cavity and concurrently therewith continuing to inject said first material through said passageway in a sheath around said melt of said second material at a rate such that the spreading of said the melt of first material by said second material is incapable of interrupting the continuity of the layer of said first material.

4,014,967
METHOD AND MOLD FOR THE DISCONTINUOUS PRODUCTION OF FOAM PLASTIC PARTS

Adolf Hattenberger; Walter Lind, and Hubert Strasser, all of Ferndorf, Austria, assignors to Osterreichische Heraklith Aktiengesellschaft, Radenthein, Austria

Filed Jan. 23, 1975, Ser. No. 543,447
Claims priority, application Austria, Jan. 28, 1974, 671/74
Int. Cl.² B29D *27/04*
U.S. Cl. 264—51 **3 Claims**



1. A method for discontinuous mold production of foam plastic parts comprised of the following steps:

locating an open top interior lid mounting means in an open mold having a base, depositing a foamable reaction mixture into said open top lid mounting means within said open mold; providing a floating lid within said mold; both said lid and said lid mounting means being adapted to slide vertically within said mold; locating said lid on said lid mounting means within said mold at a predetermined height from said mold base at least equal to 50 percent of the final height of the foam part being molded; joining said lid and said lid mounting means one to the other; initiating expansion of the foamable reaction mixture; expanding said foamable reaction mixture initially through a first stage to said predetermined height to engage said lid and said lid mounting means wherein said first stage is characterized by free expansion of the foam mixture; and expanding said foamable reaction mixture through a second stage to a desired final foamed plastic height wherein said second stage is characterized by continuous foam contact with said lid and said lid mounting means whereby said lid and said lid mounting means are movable with said expanding foam mixture only during said second stage expansion and through a distance substantially equal to the distance between said predetermined height and the final height of the foam part.

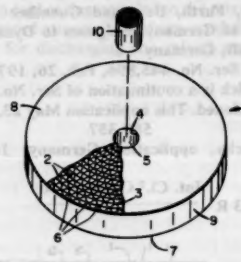
4,014,968
SHRINKAGE CONTROL OF CELLULAR CERAMIC BODIES HAVING AXIAL CAVITIES

Raphael A. Simon, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 19, 1974, Ser. No. 489,925
Int. Cl.² C04B *33/32*; B21D *53/02*
U.S. Cl. 264—56 **3 Claims**

1. A method of controlling the firing shrinkage and delamination in the inner half of a disc-type, honeycomb ceramic matrix having a plurality of unobstructed gas passages extending therethrough substantially parallel to the central axis of the matrix and defined by alternate layers of flat and corrugated ceramic sheets wrapped around an axial hub cavity extending therethrough, the improvement comprising

firing the honeycomb ceramic matrix with a temporary plug which substantially fills the hub cavity and which undergoes substantially the same radial shrinkage as the honeycomb ceramic matrix during the firing cycle and

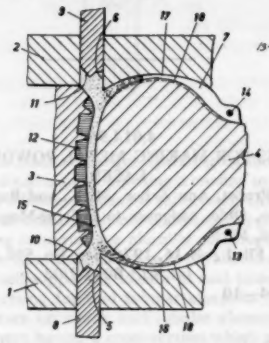


removing the plug from the hub cavity after completion of the firing cycle.

4,014,969
METHOD OF MAKING A MOLDED ARTICLE WITH ORIENTED FIBER REINFORCEMENTS

Werner Görter, Baden; Erich Kresta, Perchtoldsdorf, and Horst Stumpf, Baden, all of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 367,473, June 6, 1973, Pat. No. 3,901,961, which is a division of Ser. No. 167,768, July 30, 1971, Pat. No. 3,837,986. This application Feb. 6, 1975, Ser. No. 547,713
Claims priority, application Austria, Aug. 5, 1970, 7107/70
The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.
Int. Cl.² B29D *3/02*; B29H *5/02*
U.S. Cl. 264—108 **11 Claims**



1. A method of fabricating a molded article composed of elastomeric material having oriented reinforcing fibers therein, comprising:

a. providing a moldable preform of elastomeric material containing oriented reinforcing fibers;

b. disposing said moldable and curable elastomeric material preform in a first portion of a mold cavity and extending into a chamber adjoining said mold cavity, said first portion of said mold cavity having adjoining thereto and communicating therewith a second portion of said mold cavity;

c. displacing said moldable elastomeric material preform from said chamber, causing flow of said elastomeric material into said second portion of said mold cavity;

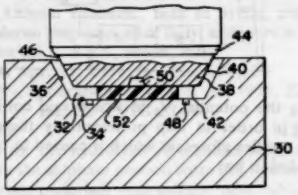
d. reorienting, by said flow, said fibers in the elastomeric material flowing into said second portion of said mold cavity into a second fiber orientation direction, while leaving fibers in said first portion of said mold cavity as originally oriented; and

e. curing said elastomeric material preform, thereby forming said molded article.

4,014,970
SOLID STATE FORMING OF THERMOPLASTIC MATERIAL

Herbert A. Jahnle, Havertown, Pa., assignor to The Budd Company, Troy, Mich.

Continuation of Ser. No. 464,279, April 25, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,344
Int. Cl.² B29F 5/00
U.S. Cl. 264—161 9 Claims



1. A method of solid state forming an article or thermoplastic material, said method comprising:
heating a blank of said thermoplastic material to a temperature proximate to and below the temperature at which said material experiences a transition from its solid to its plastic phase;
placing said blank heated at said temperature in an open mold between a rigid portion thereof displaceable relative to another rigid portion thereof, said blank having a surface area relatively smaller than the surface area of said mold and a volume relatively larger than the volume of the mold cavity defined when said mold is closed;
maintaining said mold at room temperature;
displacing one of said rigid portions of said mold relative to the other rigid portion of said mold at a relative velocity of at least 6.4 cm per second for impacting said blank and placing said blank under compressive strain and causing a substantial decrease in thickness of said blank;
maintaining said blank in said mold under said compressive strain for less than 5 seconds for causing said blank to abruptly expand between said mold rigid portions and the material of said blank to flow and fill said mold cavity for forming said article, with the excess of said material exuding from said mold cavity forming a flash;
allowing said article to cool sufficiently to remove from said mold without distorting said article; and
removing said flash.

4,014,971
METHOD FOR MAKING A TYMPANIC MEMBRANE PROSTHESIS

Rodney C. Perkins, Palo Alto, Calif.

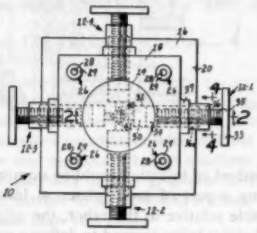
Filed May 11, 1973, Ser. No. 359,346
Int. Cl.² B29C 23/00
U.S. Cl. 264—219 3 Claims

1. A method of making a biosynthetic tympanic membrane and a biosynthetic tympanic membraneossicular substitute having a concave and a convex surface, comprising the steps of:
making a mold having the shape of a natural tympanic membrane;
preparing collagenous tissue for placement on said mold;
placing said tissue on said mold and shaping said tissue thereon;
treating said tissue with buffered formaldehyde, gluteraldehyde or another functionally similar fixative agent on said mold for causing said tissue to retain the external shape of said mold upon removal from said mold;
forming a prosthetic receiving means of collagenous material on a surface of said tissue for receiving natural and prosthetic ossicle members; and
removing said treated tissue from said mold.

4,014,972
METHOD OF MOLDING A MULTI-COLORED DISC

Robert I. Rentz, 1818 Devils Backbone Road, Cincinnati, Ohio 45238

Division of Ser. No. 20,883, March 19, 1970, Pat. No. 3,859,020. This application Nov. 7, 1974, Ser. No. 521,867
Int. Cl.² B29C 5/00; B29D 7/02
U.S. Cl. 264—245 5 Claims



comprises: (1) presoaking an unstretched braided silk suture in a non-corrosive liquid for at least about one-half hour to wet the silk fibers; (2) stretching said presoaked suture, while the same is immersed in a non-corrosive liquid, until the suture is stretched from about 5 to about 35% of its original length; and (3) drying said stretched suture in a temperature range of from about 70° to about 300° F., while maintaining the same under tension.

4,014,974

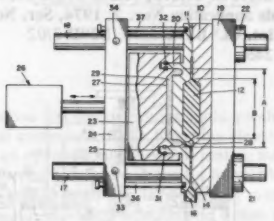
PRESSLESS INJECTION MOLDING

Lawrence C. Cessna, Jr., Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 551,178, Feb. 19, 1975, Pat. No. 3,972,668. This application Dec. 31, 1975, Ser. No. 645,762

Int. Cl.² B29F *1/06*

U.S. Cl. 264—328 **2 Claims**



1. A method of injection molding comprising:

providing a pair of mold plates at least one of which is movable relative to the other, the adjacent faces of said mold plates being formed to define a mold cavity therebetween;

providing a backing plate mounted for limited linear movement relative to the rear face of the movable mold plate, the adjacent faces of said backing plate and movable mold plate being formed to define a false cavity therebetween which is filled with a substantially incompressible compliant material;

initially urging said backing plate and said movable mold plate against said other mold plate;

locking said backing plate against rearward motion;

injecting fluid plastic material under pressure into said mold cavity; and

utilizing the pressure of said injected material to act against said compliant material to generate additional forces urging the mold plates together to counteract the forces generated by said plastic material within said mold cavity.

4,014,975

METHOD FOR SEPARATING THE ISOTOPES OF A CHEMICAL ELEMENT

Fernand Marcel Devienne, 117 La Croisette, 06400 Cannes, France

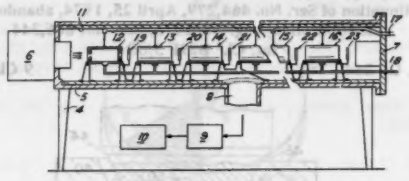
Continuation-in-part of Ser. No. 549,843, Feb. 13, 1975, abandoned. This application Apr. 29, 1975, Ser. No. 572,632

Claims priority, application France, Feb. 21, 1974, 74.05943

Int. Cl.² C01G *43/00*; B01D *59/50*

U.S. Cl. 423—19 **15 Claims**

1. A method for separating the isotopes of a chemical element, wherein said method consists in producing a beam of positive or negative primary ions of at least one compound of said element, in accelerating said ion beam in order to pass said beam through a predetermined number of collision boxes which are open at both ends and placed one after another in series, in successively initiating within each collision box, by inelastic collisions of said ions with the molecules of a neutral target gas with which said boxes are filled at low pressure, the dissociation of a given percentage of the primary ions into at least two fragments such that one fragment is a secondary ion which appears in the form of at least two different isotopic species with respect to the elemtent to be separated, and in



choosing the potential V_2 to which said collision boxes are brought in order to trap preferentially therein one of the isotopic species aforesaid which is caused to condense within each collision box.

4,014,976

PROCESS FOR PRODUCTION OF TITANIUM TETRACHLORIDE

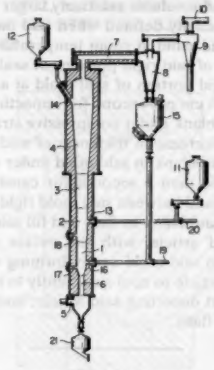
Masaaki Adachi, Ohtsu; Takayoshi Shirai, Yokkaichi, and Norio Nakasuzi, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Mar. 24, 1976, Ser. No. 670,074

Claims priority, application Japan, Mar. 28, 1975, 50-38260

Int. Cl.² C01G *23/02*

U.S. Cl. 423—79 **12 Claims**



1. An improved process for continuous production of titanium tetrachloride by chlorinating a titaniferous material in a dilute-phase fluidization system, which comprises I feed (a) a fine particulate titaniferous material having a particle size of 400 to 150 mesh (Tyler standard) as a mean value, (b) a coarse particulate solid carbonaceous substance having a particle size as a median value of at least three times as large as that of the titaniferous material and (c) a chlorine-containing gas to a reactor, the reactor having (d) a substantially vertical and long solid suspension zone of a ratio of height to lower part diameter of at least 10 in which (e) a ratio of upper part sectional area to lower part sectional area is from 1.2 to 10 so that the velocity of the upwardly flowing gas does not increase as the gas ascends. (2) controlling the amounts of said reactants fed so that, in the solid suspension zone, (f) the maximum value of the superficial linear velocity of the gas is from 1 to 10 m/sec., (g) the solid concentration is from 10 to 200 kg/m³, and (h) a ratio of the solid carbonaceous substance in solids is from 70 to 99% by weight, (3) repeating pneumatic transport and reflux of most of the solid carbonaceous substance in the upward flow of the gas to form a dilute-phase suspension in which the titaniferous material is chlorinated at

a temperature of 900° to 1400° C while is ascends being entrained by the gas flow, and 4 removing the reaction product gas from the upper part of the reactor and separating the reaction product gas into a chloride gas containing titanium tetrachloride and the unreacted solid substances.

4,014,977

PROCESS FOR THE HYDROLYSIS OF TITANIUM SULPHATE SOLUTIONS

Luigi Piccolo; Antonio Paolinelli, both of Milan, and Tullio Pellizzon, Paderno Dugnano, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A, Milan, Italy

Filed Apr. 21, 1976, Ser. No. 679,125
Claims priority, application Italy, Apr. 30, 1975, 22878/75
Int. Cl.² C01G *23/06*
U.S. Cl. 423—85 12 Claims

1. A method for the hydrolysis of titanium sulphate solutions obtained in the sulphate process from the reaction products of titaniferous materials with sulfuric acid, which comprises

a. gradually bringing into contact a first solution of titanium sulphate, solution A, having a titer, expressed as TiO_2, of from 230 to 260 g/l and an acid factor of from 1.75 to 185, heated to a temperature of from 88° to 98° C, and water heated to a temperature of from 88° to 98° C, thus inducing the formation of hydrolysis nuclei by autonucleation;

b. gradually adding a second solution of titanium sulphate, sodium B, having a titer, expressed as TiO_2, of from 230 to 260 g/l and an acid factor of from 2.1 to 2.4, heated to a temperature of from 88° to 98° C, to the mixture obtained at stage (a), maintained at a temperature of from 88° to 98° C, while maintaining a volumetric ratio of from 3:100 to 12:100 between the solution A and the solution B and a volumetric ratio of from 3:1 to 5:1 between the sum of the solutions A and B and the water used at stage (a);

c. heating the resulting mixture at boiling point, thereby to provoke the hydrolysis of the titanium sulphate added at stage (b) by induced nucleation by means of the hydrolysis nuclei obtained at stage (a).

4,014,978

AIR POLLUTION CONTROL SYSTEM AND METHOD

Herschel A. Klein, Windsor, and Carl R. Bozzuto, Waterbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 24, 1970, Ser. No. 66,272
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² B01D *53/34*
U.S. Cl. 423—242 4 Claims

1. A method of removing sulfur dioxide from the flue gas produced by the combustion of sulfur-containing fuels comprising the steps of:

a. contacting said flue gas in a scrubbing zone with an aqueous scrubbing stream containing an alkaline earth metal bicarbonate in solution, the amount of said alkaline earth metal bicarbonate in solution being in excess of the amount required to completely react with said sulfur dioxide in said flue gas whereby said sulfur oxides react with said bicarbonate to produce alkaline earth metal bisulfite in solution and whereby the pH of said aqueous scrubbing stream during said contact is maintained between 6.0 and 4.5,

b. withdrawing said aqueous scrubbing solution from said scrubbing zone,

c. contacting said aqueous scrubbing stream containing said bisulfite in solution with an oxygen-containing gas stream whereby said bisulfite is oxidized to form alkaline earth metal sulfate precipitate and sulfuric acid in solution,

d. introducing alkaline earth metal carbonate into said aqueous scrubbing stream whereby said carbonate reacts with said sulfuric acid to form additional alkaline earth metal sulfate precipitate and said excess alkaline earth metal bicarbonate in solution,

e. separating said alkaline earth metal sulfate precipitate from said aqueous scrubbing stream, and

f. recycling said aqueous scrubbing stream containing said excess alkaline earth metal bicarbonate to step (a).

4,014,979

METHOD OF PRODUCING WURTZITE-LIKE BORON NITRIDE

Anatoly Nikolaevich Dremin, p.o. Chernogolovka, 3 ulitsa, 3, kv. 4; Oleg Nikolaevich Breusov, p.o. Chernogolovka, 1 ulitsa, 25, kv. 26; Tamara Vasilievna Bavina, p.o. Chernogolovka, 1 ulitsa, 14a, kv. 21, all of Moskovskaya oblast, Noginsky raion, and Sergei Vladimirovich Pershin, ulitsa Komsomolskaya, 132, Noginsk Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 248,526, April 28, 1972, abandoned. This application July 3, 1975, Ser. No. 592,715
Claims priority, application U.S.S.R., July 19, 1971, 1692355
Int. Cl.² C01B *21/06, 35/14*
U.S. Cl. 423—290 5 Claims

1. A method of producing highly imperfect wurtzitic boron nitride with enhanced activity, comprising preparing a mixture consisting essentially of a powder of graphitic boron nitride and a sufficient amount of an additive selected from the group consisting of water and aqueous alkaline solutions to fill the pores between the particles of said graphitic boron nitride, and subjecting said mixture to the action of a shock wave with a pressure of not less than 100 kbar.

4,014,980

METHOD FOR MANUFACTURING GRAPHITE WHISKERS USING CONDENSED POLYCYCLIC HYDROCARBONS

Hiroto Fujimaki; Haruhisa Hayashi, and Takashi Kawahara, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 382,128, July 24, 1973, abandoned. This application July 29, 1975, Ser. No. 600,078
Claims priority, application Japan, July 27, 1972, 47-74557
Int. Cl.² C01B *31/04*
U.S. Cl. 423—448 7 Claims

1. A method for manufacturing graphite whiskers having a diameter of from 1 to 50 microns, a tensile strength of at least 1,000 kg/mm² and a modulus of elasticity of at least 5×10^4 kg/mm², which comprises the steps of gasifying one or more liquefied organic compounds having a condensed polycyclic structure of substantially two to five benzene rings, the atomic ratio of H/C thereof being 1 at most; mixing the gasified substance derived from one part by volume of the liquefied organic compound with 500 to 5000 parts by volume of an inert gas mixed with 0.1 to 5 parts by volume of an active gas selected from the group consisting of carbon monoxide, carbon dioxide and water vapor; passing the resulting gaseous mixture at a substantially atmospheric pressure through a reaction furnace containing therein a heat-resistant substrate to deposit thereon thermally cracked carbon nuclei at a temperature of from 700° to about 890° C. for a period of at least 5 minutes, followed by 900° to 1200° C. to obtain precursory carbon whiskers at a growing velocity of at least 0.5 mm per minute; and graphitizing the precursory carbon whiskers in another furnace at a temperature of from 2700° to 3000° C. for a period of from 1 to 10 minutes in an atmosphere of inert gas.

4,014,981

REMOVAL OF SULFUR FROM STACK GASES

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,013
Int. Cl.² B01D 57/00; C01B 17/00
U.S. Cl. 423—506 10 Claims

1. A process for diminishing environmental pollution resulting from the burning of sulfur containing fuels which comprises:

burning said sulfur containing fuels thereby producing hot products of combustion containing oxides of sulfur and carbon;

separating said oxides of sulfur from said hot combustion products before they cool to any appreciable extent and while they are still at an elevated temperature, by purely physical means in which the hot combustion products are subjected to centrifugal force;

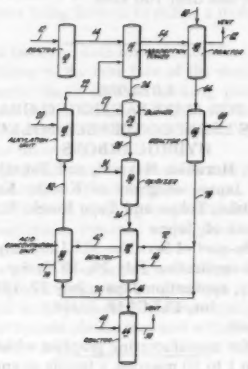
and recovering the hot sulfur oxides before they have cooled to any appreciable extent.

4,014,982

COMBINED PROCESS FOR UPGRADING SPENT ALKYLATION ACID AND REDUCING NOXIOUS GAS CONTENT OF WASTE GASEOUS STREAMS

Peter L. Paull, Weston, Conn., and James M. Caffrey, Jr., Wappingers Falls, N.Y., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,745
Int. Cl.² C01B 17/72
U.S. Cl. 423—528 18 Claims



1. In the continuous formation of carbon dioxide, nitrogen and concentrated sulfuric acid from industrial flue gas comprising nitrogen oxides, sulfur dioxide, oxygen, and water and spent alkylation acid including hydrocarbons, water and sulfuric acid, the steps that comprise:

a. contacting said flue gas with a first oxidation catalyst to effect conversion of the nitrogen oxides to nitrogen dioxide and a portion of said sulfur dioxide to sulfur trioxide,

b. admixing the oxidized flue gas of step (a) with spent alkylation acid to absorb at least a part of the oxides of sulfur and nitrogen resulting in step (a),

c. treating the unabsorbed gases from step (b) composed of sulfur dioxide and nitrogen oxides with carbon monoxide in the presence of a second oxidation catalyst to yield nitrogen, carbon dioxide and sulfur and separating said nitrogen and carbon dioxide from said sulfur,

d. burning said alkylation acid containing absorbed flue gases in the presence of oxygen to reduce hydrocarbon and water content thereof to produce a mixture comprising carbon dioxide, nitrogen oxides and sulfur dioxide,

e. contacting said mixture resulting from step (d) with a third oxidation catalyst in the presence of oxygen to effect conversion therein of said sulfur dioxide to sulfur trioxide,

f. combining the sulfur trioxide containing mixture resulting from step (e) with a portion of the sulfur trioxides formed in step (i) with water to form sulfuric acid in the aqueous phase,

g. separating the sulfuric acid formed in step (f) from unabsorbed nitrogen oxides and carbon dioxide gases of step (f), contacting said unabsorbed carbon dioxide and nitrogen oxides with carbon monoxide in the presence of a fourth oxidation catalyst to form carbon dioxide and nitrogen,

h. adding a portion of the sulfur trioxide formed in step (i) to the separated sulfuric acid of step (g) to effect greater concentration thereof,

i. oxidizing the sulfur separated in step (c) in the presence of a fifth oxidation catalyst and oxygen to produce sulfur trioxide.

4,014,983

REMOVAL OF HYDROGEN SULFIDE FROM GASES

Leslie C. Hardison, Barrington, Ill., assignor to Air Revources, Inc., Palatine, Ill.

Filed Apr. 7, 1975, Ser. No. 566,042
Int. Cl.² C01B 17/04
U.S. Cl. 423—575 3 Claims

1. In a Claus process wherein a hydrogen sulfide rich gas is treated in reactors for removal of hydrogen sulfide and the effluent tail gas from said reactors is passed through an incinerator, the improved method of treating said tail gas which comprises:

a. contacting said tail gas, in a first contacting zone, with an aqueous chelated iron solution which has been contacted previously with sulfur dioxide, whereby to effect reaction of the hydrogen sulfide in said tail gas with sulfur dioxide;

b. withdrawing from said first contacting zone a residual gas stream which has substantially all the hydrogen sulfide removed therefrom but which contains other sulfur-containing compounds, such as CS_2, COS, and free sulfur, and passing said residual gas stream through said incinerator wherein said sulfur-containing compounds are converted to sulfur dioxide;

c. withdrawing used solution from said first contacting zone and contacting the same, in a second contacting zone, with the sulfur dioxide-containing gas stream from said incinerator, thereby removing sulfur dioxide;

d. recycling the resultant sulfur dioxide-containing solution from said second contacting zone to said first contacting zone;

e. discharging the treated gas from said second contacting zone; and

f. recovering the sulfur formed by the reaction of hydrogen sulfide with sulfur dioxide in step (a).

4,014,984

RECOMBINING OF DISSOCIATED HYDROGEN AND OXYGEN

Marvin J. Parnes, Norwalk, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 301,698, Oct. 27, 1972, Pat. No. 3,859,053. This application Oct. 8, 1974, Ser. No. 513,029
Int. Cl.² C01B 5/00
U.S. Cl. 423—580 3 Claims

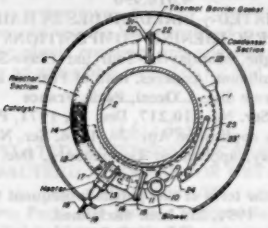
1. A method for removing and recombining dissociated H_2 and O_2 occurring in a radioactive atmosphere of a containment zone to preclude a build-up of free H_2, which comprises:

a. introducing the dissociated gaseous stream to the inlet end of and passing the same through an elongated tubular

and circular zone disposed in a plane so angled that the inlet end is above the outlet end thereof, said circular zone being above said containment zone;

b. preheating the gaseous stream near the inlet end of said tubular zone to a temperature suitable for the recombination of the H_2 and O_2 contained therein;

c. therefter contacting the preheated stream in a next adjacent portion of said tubular and circular zone with a gas pervious body of an all metal catalyst to form H_2O vapor from the H_2 and O_2;



d. passing said preheated stream through a thermal barrier zone to prevent heat transfer to a following cooling portion of said tubular and circular zone then cooling the reacted gaseous stream in a final cooling portion of said tubular and circular zone to condense said H_2O vapor; and

e. returning the resultant water condensate by gravity flow from the outlet end of said tubular and circular zone to said containment zone.

4,014,985

PRECIPITATION OF ALUMINUM OXIDE HAVING LOW SODIUM OXIDE CONTENT

Leonard W. Haleen, Edwardsville, Ill., and Alan Pearson, St. Louis, Mo., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 643,380

Int. Cl.² C01F 7/14

U.S. Cl. 423—629 **2 Claims**

1. The process of producing an aluminum oxide having a sodium oxide content after calcining of less than 0.1% by weight which comprises:

a. continuously precipitating aluminum oxide in a first tank maintained at a temperature of 55°–80° C and an alumina-to-caustic ratio of 0.68 while

1. adding feed liquor at an alumina-to-caustic ratio of 1.04 into said tank at a flow rate in liters per minute equal to approximately 0.043% of the volume of said tank; and

2. simultaneously adding aluminum hydroxide seed slurry to said tank at a rate in meters³ per hour to maintain a precipitation rate in said tank of less than 0.03 grams Al_2O_3 per hour per meter³ of said aluminum hydroxide seed added to the tank per hour;

b. feeding the resultant precipitate slurry from said first tank to a second tank maintained at a temperature of about 70° C at a flow rate in liters per minute equal to 0.115% of the volume of said second tank to maintain an alumina-to-caustic ratio of about 0.61 in said second tank; and

c. recovering a low soda aluminum hydroxide precipitate from said second tank characterized by a sodium oxide content after calcining of less than 0.1% by weight.

4,014,986

X-RAY CONTRAST MEDIA

Guy Tilly; Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

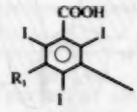
Filed May 20, 1975, Ser. No. 579,279

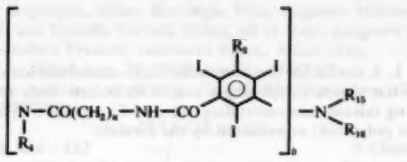
Claims priority, application United Kingdom, May 31, 1974, 24169/74; July 31, 1974, 33900/74

Int. Cl.² C07C 63/10; A61K 29/02

U.S. Cl. 424—5 **5 Claims**

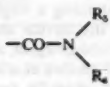
1. An iodobenzene derivative selected from the group consisting of a compound of the formula





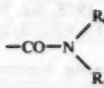
in which:

R_1 is



R_5 and R_6 being each selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyloxyalkyl,

R_2 is



in which R_9 and R_{10} have the meanings given for R_5 and R_6,

R_4 is selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl,

R_{15} is selected from the group consisting of hydrogen, lower alkanoyl and polyhydroxy lower alkanoyl,

R_{16} is selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyl,

n is an integer from 1 to 5

b is 1 or 2

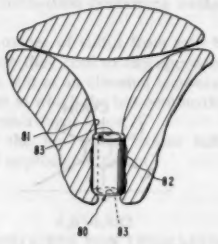
and the different R_2, R_4 and n which exist when $b = 2$ may have the same or different meanings,

a lower alkyl ester thereof and a salt thereof with a pharmaceutically acceptable base.

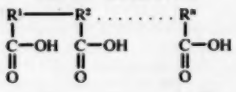
4,014,987
DEVICE FOR DELIVERY OF USEFUL AGENT

Jorge Heller, Palo Alto, Calif., and Richard W. Baker, Bend, Oreg., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 476,246, June 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 318,831, Dec. 27, 1972, abandoned. This application June 30, 1975, Ser. No. 591,443
Int. Cl.² A61K 47/00, 9/02
U.S. Cl. 424—15 13 Claims



1. A device for the controlled local administration of drug to the vagina comprising a matrix or hollow body made of drug release rate controlling material formed of a hydrophobic poly(acid) represented by the formula:



wherein the R's are organic radicals independently selected to provide on the average from 8 to 22 total carbon atoms for each carboxylic hydrogen, said body of drug release rate controlling material containing a vaginally acceptable drug dispersed therethrough, the device shaped and adapted for insertion and placement in the vagina, and wherein the release rate controlling material erodes at a controlled rate over a prolonged period of time when the device is in the vagina in response to the environment of the vagina, thereby releasing the dispersed drug to the vagina at a controlled rate over a prolonged period of time.

4,014,988
METHOD FOR TREATING HYPERMENORRHEA WITH UTERINE THERAPEUTIC SYSTEM

Bruce B. Pharriss, Palo Alto; Ross R. Erickson, Sunnyvale, and Stephen A. Tillson, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Oct. 31, 1975, Ser. No. 627,506
Int. Cl.² A61K 9/02, 31/58, 31/56
U.S. Cl. 424—14 17 Claims

1. A method for treating hypermenorrhea in a warm blooded animal which method comprises administering to the uterus of the animal from a means sized, shaped and adapted for placement in the uterus a therapeutically effective amount of a progestational steroid for a prolonged period of time to impart relief from said hypermenorrhea.

4,014,989
PHARMACEUTICAL AEROSOL COMPOSITIONS COMPRISING PUTRESCINE PROSTAGLANDINS

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 413,514, Nov. 7, 1973, abandoned, which is a division of Ser. No. 72,869, Sept. 16, 1970, Pat. No. 3,845,111. This application Oct. 1, 1975, Ser. No. 618,581
Int. Cl.² A61K 9/00, 31/215, 31/205
U.S. Cl. 424—45 1 Claim

1. A pharmaceutical aerosol formation for inhalation therapy wherein the aerosol is comprised of about 100 mg to 500 mg of a prostonate selected from the group consisting of 1,4-diaminobutane-11α,15(S)-dihydroxy-9-oxo-5-cis,13-trans-prostadienoate; 15(S)-hydroxy-9-oxo-10,13-trans-prostadienoate; 9α,11α,15(S)-trihydroxy-5-cis,13-trans-prostadienoate; and 9α,11α,15(S)-trihydroxy-5-cis,13-trans,17-cis-prostatrienoate wherein the prostonate is mixed with an inert non-toxic gaseous propellant and a pharmaceutically acceptable cosolvent for the propellant and the prostonate.

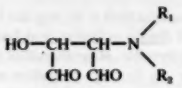
4,014,990
ANIMATED-γ-DIALDEHYDES IN HAIR STRENGTHENING COMPOSITIONS

Guy Vanlerberghe, Montjay-La-Tour par Claye-Souilly, and Georges Rosenbaum, Asnieres, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 210,217, Dec. 20, 1971, Pat. No. 3,812,246. This application Apr. 24, 1974, Ser. No. 463,808
Claims priority, application Luxembourg, Dec. 24, 1970, 62317
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.² A61K 7/66
U.S. Cl. 424—70 11 Claims

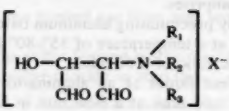
1. A process for strengthening the hair for the purpose of improving its cosmetic qualities comprising applying to the hair for a period of 5 to 60 minutes at a temperature of 15°–50° C a composition comprising a solution in a solvent selected from the group consisting of water and an aqueous alcohol solution wherein the alcohol component is selected from the group consisting of ethanol and isopropanol, of 2–25 percent by weight of said composition of a dialdehyde selected from the group consisting of

1. an aminated γ-dialdehyde having the formula



wherein R_1 and R_2 each independently are selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, hydroxy alkyl wherein the alkyl moiety has 1–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, phenyl, benzyl, (2,5-dialkoxy-4-hydroxy)-3-tetrahydrofuryl wherein each of the alkoxy moieties has 1–4 carbon atoms, β-N-aminoethyl wherein each of the alkoxy moieties has 1–4 carbon atoms, and together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of piperidinyl and morpholinyl; and

2. a quaternary ammonium salt having the formula



wherein R_1 and R_2 each independently are selected from the group consisting of alkyl having 1–6 carbon atoms, hydroxyalkyl wherein the alkyl moiety has 1–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, phenyl, benzyl, (2,5-dialkoxy-4-hydroxy)-3-tetrahydrofuryl wherein each of the alkoxy moieties has 1–4 carbon atoms, β-N-aminoethyl wherein each of the alkoxy moieties has 1–4 carbon atoms and together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of piperidinyl and morpholinyl, R_3 is selected from the group consisting of lower alkyl having 1–4 carbon atoms and benzyl, and X^- represents a member selected from the group consisting of chloride, bromide, iodide, methosulfate, ethosulfate, paratoluene sulfonate and methane sulfonate, said composition having a pH between 1.5 and 9.

4,014,991

ORAL RABIES IMMUNIZATION OF CARNIVORES

George M. Baer, and William G. Winkler, both of Stone Mountain, Ga., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 23, 1976, Ser. No. 651,810
Int. Cl.² A61K 39/28
U.S. Cl. 424—89 18 Claims

1. A method of protecting wild carnivores from rabies virus which comprises orally administering to said carnivores an immunizing dose of an attenuated liquid antirabies vaccine containing a temperature stabilizer obtained from a casein hydrolysate, said vaccine being enclosed in a bite-permeable hydrophobic plastic container and said container being surrounded by an acceptable meat bait for said carnivore.

4,014,992

ACETYLATED WATERSOLUBLE EXTRACTS OF CORYNEBACTERIA, PROCESS FOR OBTAINING THEM AND THEIR USE

Pierre Jolles, Paris, and Daniele Migliore-Samour, Kremlin-Bicetre (Val de Marne), both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 30, 1975, Ser. No. 573,199
Claims priority, application France, May 6, 1974, 74.15571
Int. Cl.² A61K 39/02, 39/00
U.S. Cl. 424—92 7 Claims

1. An immunological adjuvant composition comprising low molecular weight acetylated water soluble fragments consisting essentially of a disaccharide-tetrapeptide, a tetrasaccharide-heptapeptide and the dimer, trimer and tetramer of the latter, said adjuvant being produced by the steps of subjecting delipidated bacterial residue of *Corynebacterium Parvum* containing diaminopimelic acid to acetylation, and extraction with watersoluble alcohol and water, said fragments being acetylated, containing diaminopimelic acid, having a molecular weight between 1000±200 and 8000±200 and being associated with acetylated non-aminated reducing sugars.

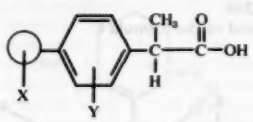
4,014,993

INHIBITION OF PLATELET AGGREGATION WITH SUBSTITUTED PHENYLHYDRATROPIC ACID COMPOUNDS

Neel C. Sekhar, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

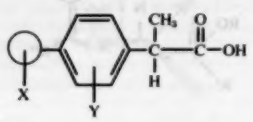
Continuation of Ser. No. 514,840, Oct. 15, 1975, abandoned, which is a continuation of Ser. No. 324,027, Jan. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 235,659, March 17, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,206
Int. Cl.² A61K 35/14, 31/19; C12B 3/00
U.S. Cl. 424—101 6 Claims

1. A process for inhibiting platelet aggregation in vitro comprising the addition of an effective amount of a compound of the formula:



wherein ○
is phenyl or cyclohexane and X and Y can be the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of from 1 to 8 carbon atoms inclusive or alkoxy of from 1 to 8 carbon atoms, inclusive and the pharmacologically acceptable salts thereof to whole blood or platelet-rich concentrates.

4. A process of prophylactic treatment to prevent clot formation comprising the administration of an effective amount of a compound of the formula:



wherein ○
is phenyl or cyclohexane and X and Y can be the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of from 1 to 8 carbon atoms, inclusive or alkoxy of from 1 to 8 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof to a human or animal having elevated platelet adhesiveness.

4,014,994

PROCESS FOR THE RECOVERY AND PURIFICATION OF PARTRICIN

Sergio Magnaghi, Milan; Eustorgio Felci, Pogliano Milanese (Mi), and Rodolfo Ferrari, Milan, all of Italy, assignors to SPA-Societa Prodotti Antibiotici S.p.A., Milan, Italy

Filed Aug. 29, 1975, Ser. No. 609,147
Claims priority, application United Kingdom, Aug. 29, 1974, 37773/74
Int. Cl.² A61K 35/00
U.S. Cl. 424—123 9 Claims

1. A process for the recovery of partricin from a fermented liquor containing said partricin, which comprises adding a surface-active agent selected from the group consisting of a cationic alkyl aryl ammonium salt and an anionic alkali metal alkyl sulphate to the fermented liquor in an amount of from 10 to 40 g of the surface-active agent per liter of the fermented liquor at a pH of from 9 to 11, removing insoluble material from the resultant mixture and isolating the partricin from the resultant aqueous solution.

4,014,995

COSMETICS CONTAINING FINELY DIVIDED OAT FLOUR

Angelo L. Juliano, Chicago, and Aaron Miller, Northbrook, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 398,651, Sept. 19, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,695
Int. Cl.² A61K 31/00, 47/00
U.S. Cl. 424—168 5 Claims

1. A liquid cosmetic preparation comprising a colloidally stable dispersion of oat flour having a particle size such that at least about 98% thereof passes through a 200 mesh screen (U.S. Sieve Series) in a liquid vehicle, said oat flour being employed in an amount of from about 1 to 20% by weight of the preparation.

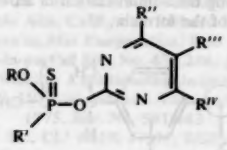
4,014,996

O-ALKYL-O-PYRIMIDIN (2)YL-THIONOPHOSPHONIC ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 25, 1975, Ser. No. 607,327
Claims priority, application Germany, Aug. 24, 1974, 2440677
Int. Cl.² C07F 9/65; A01N 9/36
U.S. Cl. 424—200 11 Claims

1. An O-alkyl-O-pyrimidin(2)yl-thionophosphonic acid ester of the formula



in which
R is alkyl with 1 to 6 carbon atoms,
R′ is alkyl with 1 to 6 carbon atoms or phenyl,
R″ and R″″ each independently is hydrogen or alkyl with 1 to 4 carbon atoms, and
R‴ is halogen or hydrogen

4,014,997

ACYLPHOSPHONATE ESTERS

Leo Ralph Swett, Waukegan, Ill.; Robert George Stein, Kenosha, Wis., and George William Carter, Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 31, 1975, Ser. No. 627,561
Int. Cl.² A01N 9/36; C07D 209/04; C07F 9/40
U.S. Cl. 424—200 **7 Claims**

1. The acylphosphonate ester of the formula

wherein R′ is a lower alkyl radical and wherein R is an acyl moiety of an organic, pharmaceutically acceptable acid having anti-inflammatory properties.

2. A composition in the form of an ointment for alleviating the symptoms of inflammation of the skin in warm-blooded animals containing a pharmaceutically acceptable ointment base and dispersed therein, between 0.5 and 5% by weight of the acylphosphonate ester of claim 1.

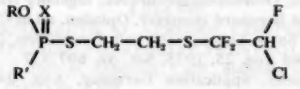
4,014,998

O-ALKYL-S-(2-(1,1,2-TRIFLUORO-2-CHLOROETHYL-MERCAPTO)-ETHYL)(THIONO)(DI) THIOLPHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES AND PESTICIDAL USE

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Steinenbrueck, and Bernhard Homeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 19, 1976, Ser. No. 659,610
Claims priority, application Germany, Mar. 8, 1975, 2510138
Int. Cl.² A01N 9/36; C07F 9/165, 9/40, 9/24
U.S. Cl. 424—216 **10 Claims**

1. An O-alkyl-S-[2-(1′,1′,2′-trifluoro-2′-chloroethylmercapto)-ethyl](thiono)(di)thiolphosphoric(phosphonic) acid ester or ester-amide of the formula



(I)

in which
R is alkyl with 1 to 6 carbon atoms,
R′ is alkyl, alkoxy, alkylmercapto or alkylamino with 1 to 6 carbon atoms in each alkyl moiety, amino or phenyl, and
X is oxygen or sulfur.

9. A method or combating arthropod or nematode pests which comprises applying to the pests or to a habitat thereof an arthropodically or nematicidally effective amount of a compound according to claim 1.

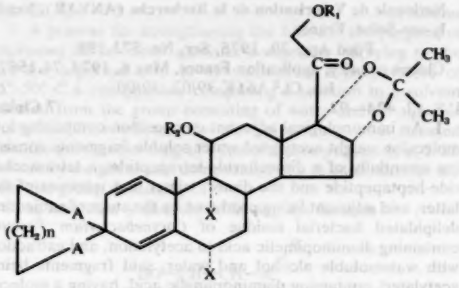
4,014,999

HALO-STEROIDAL THIOKETALS FOR TREATING INFLAMMATION

Robert A. Mallory, and Joseph A. Settepani, both of Somerville, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 463,707, April 24, 1974, Pat. No. 3,970,646. This application Mar. 2, 1976, Ser. No. 663,174
Int. Cl.² A61K 31/58
U.S. Cl. 424—241 **10 Claims**

1. A method of treating inflammation which comprises administering an effective amount of a compound of the formula:



in a pharmaceutically acceptable carrier, wherein R_1 is hydrogen, lower acyl having 2–5 carbon atoms, tetrahydropyranyl or lower alkyl; R_2 is hydrogen or lower acyl having 2–5 carbon atoms; A is oxygen or sulfur provided that at least one of A is sulfur; *x* is fluoro, chloro or bromo, and *n* is an integer from 0–3.

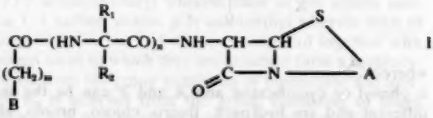
4,015,000

6-ACYLAMINO-PENAM-3-CARBOXYLIC AND 7-ACYLAMINO-3-CEPHEM-4-CARBOXYLIC ACIDS

Károly Kocsis, Basel; Bruno Fechtig, Reinach, and Hans Bickel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

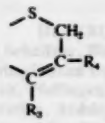
Filed Sept. 18, 1973, Ser. No. 398,512
Claims priority, application Switzerland, Sept. 29, 1972, 14257/72; Mar. 14, 1973, 3694/73; May 24, 1973, 7444/73
Int. Cl.² C07D 501/22, 501/24, 501/26
U.S. Cl. 424—246 **11 Claims**

1. A compound of the formula I



I

wherein the grouping -S-A- represents a radical of the formula Ib



Ib

wherein R_3 denotes a carboxyl group and R_4 represents hydrogen, methyl, lower alkanoyloxymethyl, benzoylthiomethyl, pyridiniummethyl, 1-oxidized-2-pyridylthiomethyl, or pyridiniummethyl or 1-oxidized-2-pyridylthiomethyl substituted by lower alkyl, hydroxy, chloro, carboxy or carbamoyl, and wherein, if the radicals R_1 and R_2 are separate, R_1 is hydrogen and R_2 is phenyl, thienyl or furyl and, if the radicals R_1 and R_2 are linked, they form, together with the carbon atom, cycloalkyl ring with 4 to 7 carbon atoms, and wherein *m* represents 0 or 1, *n* represents 1 and B represents 2,4-dioxo-1,2,3,4-tetrahydro-pyrimidyl, 2,6-dioxo-1,2,3,6-tetrahydro-pyrimidyl, 2,4-dihydroxy-pyrimidyl, 2,6-dihydroxy-pyrimidyl, 2,6-dithioxo-1,2,3,6-tetrahydro-pyrimidyl, 2,6 dimethoxy-pyrimidyl, 2,6-dichloropyrimidyl, 2-methylthio-6-chloro-pyrimidyl, 2-methylthio-6-hydroxypyrimidyl, 2,6-bis-morpholino-4-pyrimidyl, and therapeutically acceptable alkali, alkaline earth metal, ammonium and inner salts thereof.

4,015,001
CONTROL OF INSECTS BY NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)-METHYL ALDEHYDES AND KETONES

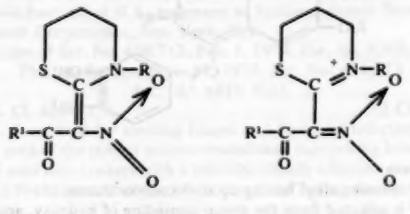
James E. Powell, Rodmersham Green near sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 547,417, Feb. 6, 1975, Pat. No. 3,962,225, which is a continuation-in-part of Ser. No. 468,122, May 8, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,990

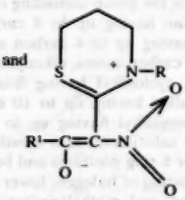
Int. Cl.² A01N *9/00, 9/12*

U.S. Cl. 424—246 **4 Claims**

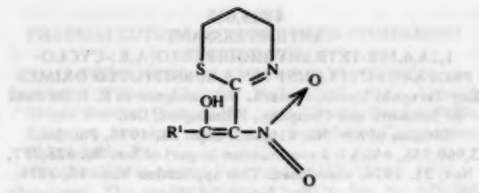
1. A method for killing insects which comprises applying to said insects or their locus a lethal dosage of a compound which exists as a resonance hybrid in which the three significant forms are represented by the formulae



and



and including when R is hydrogen, the enol form represented by the formula



wherein R is hydrogen, halogen or alkyl of from one to eight carbon atoms;

R^1 is hydrogen or contains up to thirty carbon atoms and is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, haloalkyl, haloalkenyl, alkoxyalkyl, alkoxycarbonylalkyl, alkylthioalkyl, cyanoalkyl, alkylsulfinylalkyl, and phenyl, optionally substituted by one or more of halogen, nitro, methylsulfonyl, cyano, alkyl, phenyl, alkoxy, phenoxy; heteroaryl selected from the group consisting of furanyl, 2- and 3-pyridyl; and their corresponding phenylmethyl and heteroarylmethyl counterparts.

4,015,002
1-ARYL-2-OXO-2,4,5,6,7,7A-HEXAHYDRO-INDOLES, SALTS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Marcel Pesson, Paris, and Henri Techer, Avon, both of France, assignors to Laboratoire Roger Bellon, Neuilly sur Seine, France

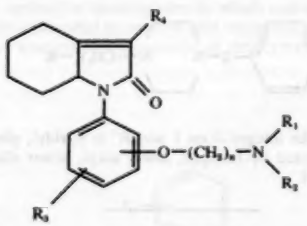
Filed Aug. 1, 1975, Ser. No. 600,937

Claims priority, application United Kingdom, Aug. 7, 1974, 34697/74

Int. Cl.² C07D *209/34, 413/12*

U.S. Cl. 424—248.58 **8 Claims**

1. A compound having the formula



I

wherein R_1 and R_2 are identical and are selected from the group consisting of straight and branched chain C_{1-5} alkyl groups, or, R_1 and R_2 together with the nitrogen atom to which they attached represent a group selected from the group consisting of piperidino, pyrrolidino or morpholino groups; n is an integer selected from 2 and 3; R_3 is selected from the group consisting of hydrogen and halogen atoms; and R_4 is selected from the group consisting of hydrogen and a phenyl group and non-toxic, physiologically acceptable acid addition salts thereof.

4,015,003

ANTIDEPRESSANT 1,1A,6,10B-TETRAHYDRODIBENZO[A,E]-CYCLOPROPA-[C]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES

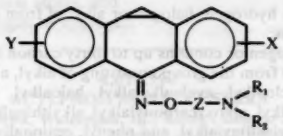
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,275

Int. Cl.² C07D *295/00, 211/06, 207/08*

U.S. Cl. 424—248.5 **3 Claims**

1. A compound of the formula



where

X or Y = H, F, Cl, Br, C_1-C_4 alkyl, C_1-C_4 alkoxy, CF_3, CH_3S, CH_3SO_2, $SO_2N(CH_3)_2$, provided that one is H;

Z = C_2-C_3 alkylene;

R_1 and R_2 together form a ring with N:

in which W can be $-(CH_2)_4-$, $-(CH_2)_5-$, or $-(CH_2)_2O(CH_2)_2-$; and its pharmaceutically suitable salts.

4,015,004

PHENYLSULFENYLPIPERAZINES

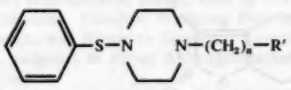
Solomon S. Klioze, and Richard C. Allen, both of Flemington, N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Aug. 26, 1975, Ser. No. 607,927

Int. Cl.² C07D *295/22*

U.S. Cl. 424—250 **13 Claims**

1. A compound of the formula



wherein *n* is the integer 0 or 1 and R′ is pyridyl, phenyl or phenyl substituted by halogen, lower alkyl, lower alkoxy or trifluoromethyl.

4,015,005

1,2,5,6-TETRAHYDRO-4H-PYRROLO(3,2,1-ij)QUINOLIN-2-ONES

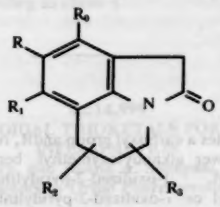
Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 473,778, May 28, 1974, abandoned. This application June 23, 1975, Ser. No. 589,371

Int. Cl.² C07D *471/06*

U.S. Cl. 424—258 **16 Claims**

1. A pharmaceutical composition for tranquilizing or inducing sleep comprising in unit dosage form an inert pharmaceutically acceptable carrier and from 40 to 1600 milligrams of a compound of the formula:



wherein

R_0, R and R_1 are independently hydrogen, fluoro, chloro or lower alkyl of 1 to 4 carbon atoms, and

R_2 and R_3 are independently hydrogen or alkyl of 1 to 4 carbon atoms,

with the proviso that at least one of R_0, R and R_1 is hydrogen.

4,015,006

3(2H)-ISOQUINOLONES THERAPEUTIC PROCESS

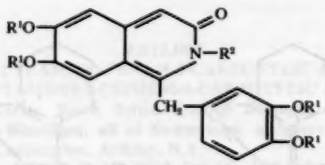
William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 423,841, Dec. 11, 1973, Pat. No. 3,910,927, which is a division of Ser. No. 184,197, Sept. 27, 1971, Pat. No. 3,798,225. This application Sept. 12, 1975, Ser. No. 612,884

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **15 Claims**

1. A process for eliciting a hypotensive and vasodilating effect in a mammal in need thereof which comprises systemic administration to said mammal a non-toxic effective dose of from about 0.05 to 20 mg./kg. of body weight of said mammal of a compound selected from the group consisting of those having the formula



wherein

R^1 is lower alkyl having up to 4 carbon atoms;

R^2 is selected from the group consisting of hydroxy, amino, lower alkylamino having up to 4 carbon atoms, lower dialkylamino having up to 4 carbon atoms, lower alkyl having up to 4 carbon atoms, alkenyl having from 3 to 6 carbon atoms, cycloalkyl having from 3 to 5 carbon atoms, phenylalkyl having up to 10 carbon atoms and substituted phenylalkyl having up to 10 carbon atoms apart from the substituent, said substituent being in the 2-, 3-, 4-, 5-, or 6-ring positions and being selected from the group consisting of halogen, lower alkyl having up to 4 carbon atoms, and methylenedioxy, or from 1 to 3 lower alkoxy groups having up to 4 carbon atoms each;

and a pharmaceutically acceptable acid addition salt thereof.

4,015,007
HETEROCYCLIC SPIRO COMPOUNDS

Karl Schaffner, Binningen; Alex Meisels, Basel, both of Switzerland; Jean Claude Roger, New York, N.Y., and Claus D. Weis, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

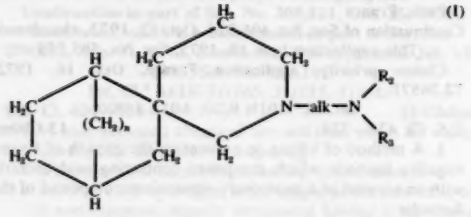
Division of Ser. No. 356,545, May 2, 1973, Pat. No. 3,914,222. This application July 23, 1975, Ser. No. 598,304

Claims priority, application Switzerland, May 4, 1972, 6613/72

Int. Cl.² C07D *221/20*

U.S. Cl. 424—267 6 Claims

1. An antiviral pharmaceutical composition comprising an antivirally effective amount of a heterocyclic spiro compound



(I)

in which alk represent ethylene, trimethylene or 2-hydroxytrimethylene, R_2 represents hydrogen, methyl or benzyl, R_3 represents hydrogen or methyl, or R_2 and R_3 together represent tetramethylene, pentamethylene, 2,2-pentamethylenepentamethylene, or 2,2-(1,4-methanopentamethylene)-pentamethylene and n denotes 1 or 2, or of a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier.

4,015,008
N,N-DICHLORO SUBSTITUTED AMINOCARBOXYLIC ACIDS AS MICROBIOCIDES

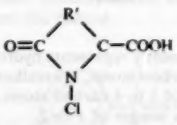
Sol Joseph Barer, Elizabeth; Richard Frederick Stockel, Bridgewater Township, and Peter Carl Valenti, East Windsor, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Division of Ser. No. 438,712, Feb. 1, 1974, Pat. No. 3,950,536. This application Sept. 10, 1975, Ser. No. 611,972

Int. Cl.² A01N *9/22*

U.S. Cl. 424—274 12 Claims

1. A method for treating fungal and bacterial infections of any area of the skin or mucous membrane comprising bringing said area into contact with a microbiocidally effective amount of an N-chloro carboxylic acid compound having the formula:



wherein R' is a divalent aliphatic hydrocarbon group having 2 to 4 carbon atoms.

4,015,009
PHARMACEUTICAL COMPOSITIONS COMPRISING SUBSTITUTED 3-CINNAMOYL-2H-PYRAN-2,6(3H)-DIONES

Lawrence William Chakrin, Haddonfield, N.J.; Kenneth Means Snader, Hatboro, Pa., and Chester Rhodes Willis, Kingston, Jamaica, assignors to SmithKline Corporation, Philadelphia, Pa.

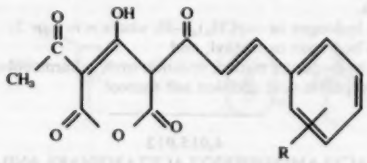
Continuation-in-part of Ser. No. 511,153, Oct. 2, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,305

Claims priority, application United Kingdom, Sept. 11, 1975, 37418/75

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 12 Claims

1. A pharmaceutical composition for inhibiting the symptoms of asthma comprising a nontoxic pharmaceutical carrier or diluent and an amount sufficient to produce said inhibition of a compound of the formula:



wherein R is hydrogen, methoxy, dimethoxy, hydroxy, methyl, carboxymethyleneoxy, acetamido or 3-acetamido-4-hydroxy.

4,015,010
ALKANOYL SUBSTITUTED BENZOIC ACIDS AND ESTERS

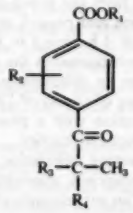
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 3, 1975, Ser. No. 554,508

Int. Cl.² A61K *31/235*, *31/19*

U.S. Cl. 424—308 25 Claims

1. A method of treating obesity which comprises administering to a mammal in need of said treatment an anti-obesity effective amount of a compound of the formula:



where

R_1 represents hydrogen, or straight chain lower alkyl, and

R_2 represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy, and

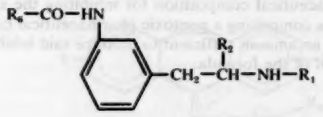
R_3 and R_4 each independently represent alkyl having 1 to 2 carbon atoms.

4,015,011
PHENYLALKYLAMINES AND SALTS THEREOF

Kurt Schromm; Anton Mentrup; Ernst Otto Renth, all of Ingelheim Am Rhein, Germany; Ludwig Pichler, Vienna, Austria, and Werner Traunecker, Ingelheim Am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Apr. 25, 1975, Ser. No. 571,719
Claims priority, application Germany, Apr. 27, 1974, 2420618
Int. Cl.² A61K 31/165
U.S. Cl. 424—324 5 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or $-(CH_2)_n-H$, where n is 1 or 2,

R_2 is hydrogen or methyl, and

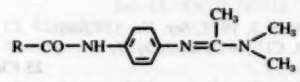
R_3 is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,015,012
4-ACYLAMINOPHENYLACETAMIDINES AND A METHOD FOR THEIR PREPARATION

Hartmund Wollweber; Ekkehard Niemers; Hans Peter Schulz; Herbert Thomas, and Peter Andrews, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 505,738, Sept. 13, 1974, Pat. No. 3,970,699. This application May 21, 1975, Ser. No. 579,446
Claims priority, application Germany, Sept. 18, 1973, 2346939
Int. Cl.² A61K 31/165
U.S. Cl. 424—324 51 Claims

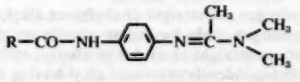
1. A pharmaceutical composition useful for treating helminthic infections in humans and animals which comprises an anthelmintically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof wherein

R is straight or branched chain alkoxyalkyl having 3 to 8 carbon atoms, either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl; or straight or branched chain alkenyloxyalkyl having 3 to 8 carbon atoms either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl in combination with a pharmaceutically acceptable non-toxic diluent or carrier.

28. A method of treating helminthic infections in humans and animals which comprises administering to a human or animal in need thereof an anthelmintically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

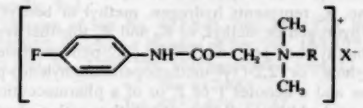
R is straight or branched chain alkoxyalkyl having 3 to 8 carbon atoms, either unsubstituted or substituted in the alkoxy moiety by one to two of the same or different members selected from the group consisting of 1 to 4 carbon atoms and phenyl; or straight or branched chain alkenyloxyalkyl having 3 to 8 carbon atoms either unsubstituted or substituted in the alkoxy moiety by on or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl.

4,015,013
CERTAIN QUATERNARY AMMONIUM SALTS USED TO CONTROL GRAM-NEGATIVE BACTERIA

André Henri Passedouet, Maisons-Laffite, and Robert Pipon, Melle, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 406,024, Oct. 12, 1973, abandoned. This application June 10, 1975, Ser. No. 585,755
Claims priority, application France, Oct. 16, 1972, 72.36571
Int. Cl.³ A01N 9/20; A01L 13/00
U.S. Cl. 424—324 13 Claims

1. A method of killing or preventing the growth of Gram-negative bacteria which comprises contacting said bacteria with an amount of a quaternary ammonium compound of the formula:



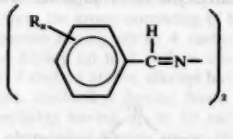
in which R is straight or branched alkyl of 7 to 16 carbon atoms and X^- is a monovalent anion, sufficient to kill or prevent the growth of said bacteria.

4,015,014
METHOD FOR THE USE OF ARYL AZINES AS ANTHELMINTICS

Robert D. Vatne; Paul B. Budde, and Jack P. Arrington, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

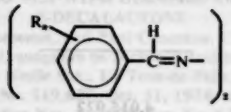
Filed Mar. 17, 1976, Ser. No. 667,779
Int. Cl.² A61K 31/165, 31/15
U.S. Cl. 424—324 28 Claims

1. A method for the control of Haemonchus in ruminant animals which comprises orally administering to said animals an anthelmintically effective amount of an aryl azine corresponding to the formula



wherein R independently represents hydrogen, hydroxy, loweralkyl of 1 to 4 carbon atoms, loweralkoxy of 1 to 4 carbon atoms, alkylamino of 1 to 4 carbon atoms, acetamido or halo and n represents an integer of 1 or 2.

15. An animal feed composition which comprises an animal feed and from 1–95 percent by weight of an aryl azine corresponding to the formula



wherein R independently represents hydrogen, hydroxy, loweralkyl of 1 to 4 carbon atoms, loweralkoxy of 1 to 4 carbon atoms, alkylamino of 1 to 4 carbon atoms, acetamido or halo and *n* represents an integer of 1 or 2.

4,015,015

CHEMICAL FIRE ALARM

Richard Norris Knowles, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 300,811, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 279,832, Aug. 11, 1972, abandoned. This application July 15, 1975, Ser. No. 596,191

Int. Cl.² A61K *31/165, 31/135, 31/445*

U.S. Cl. 424—324 **11 Claims**

1. A heat-activated chemical fire and heat alarm for warning humans of a fire hazard comprising
   a. a flammable solid substrate having bound thereto
   b. 0.0001–1.0% by weight, basis weight of the substrate, of a non-vaporous organic compound having a molecular weight no greater than about 400 which becomes vaporized upon being heated to a temperature no lower than about 200° C and forms in air at a concentration of 100 ppm or less a respiratory mucous membrane irritant, the organic compound being bound to the substrate in non-vaporous form under normal conditions of use, but is vaporized from the surface of the substrate upon exposure to a temperature no lower than about 200° C.

4,015,016

[(2-ALKOXYBERZYLIDINE)AMINO]QUANIDINES AND THEIR ANTICOCCIDAL USE

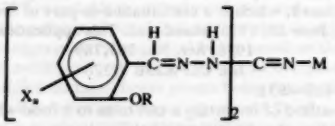
John E. Livak, Rutland, Vt., and Paul B. Budde, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 546,568, Feb. 3, 1975, Pat. No. 3,973,039. This application May 14, 1976, Ser. No. 686,358

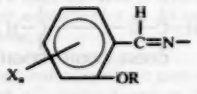
Int. Cl.² C07C *133/12;* **A61K** *31/155*

U.S. Cl. 424—326 **30 Claims**

1. A [(substituted-2-alkoxybenzylidine)amino]-guanidine compound and the pharmacologically acceptable acid addition salts thereof, the guanidine compound corresponding to the formula



wherein R represents methyl, ethyl or benzyl; X represents chloro, bromo, amino, dimethylamino, diethylamino or acetamido; M represents the radical



and *n* represents an integer of 1 or 2 with the proviso that when *n* is 1, the X representation is in the 4 ring position and when *n* is 2, the X representations are in any of the 3, 4 or 5 ring positions.

4,015,017

CERTAIN BIPHENYL DERIVATIVES USED TO TREAT DISORDERS CAUSED BY INCREASED CAPILLARY PERMEABILITY

Jean-Maurice Gazave, Paris; Alain Rancurel, Chartres, and Georges Grenier, Epernon, all of France, assignors to Laboratoires Pharmascience, Courbevoie, France

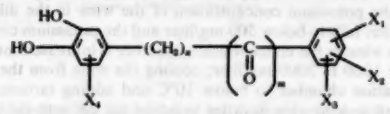
Filed Jan. 14, 1975, Ser. No. 541,022

Claims priority, application France, Jan. 15, 1974, 74.01228

Int. Cl.² A61K *31/12*

U.S. Cl. 424—331 **2 Claims**

1. A method of treating a patient suffering from a disorder caused by an increase of capillary permeability which comprises administering to such patient one to 30 mg/kg of body weight daily of a compound of the following formula:



wherein X_1, X_2, X_3, and X_4 are selected from the group consisting of H and OH, *n* is a number from 0 to 1 and $(n + m)$ equals 1 or 2, together with a pharmaceutically acceptable carrier.

4,015,018

SILAGE PROCESS AND PRODUCT

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 629,500, Nov. 6, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,211

Int. Cl.² A23K *3/03*

U.S. Cl. 426—2 **10 Claims**

1. A process of making silage which comprises intimately mixing with moisture-containing chopped vegetation from which the silage is produced a quantity of sodium diacetate and dehydrated whey in synergistic proportions, and fermenting the resultant mixture, the proportions of sodium diacetate and dehydrated whey being sufficient to enhance the protein availability of the finished silage.

4,015,019

PREPARATION OF FOAMING SOYBEAN PRODUCTS AND THE PRODUCTS THEREFROM

Koshichi Sawada, Suita; Masahiro Kajikawa, Kawanishi, and Koichi Kotani, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 1, 1975, Ser. No. 564,210

Claims priority, application Japan, Apr. 3, 1974, 49-38339

Int. Cl.² C12B *1/00*

U.S. Cl. 426—46 **5 Claims**

1. A method for preparing soybean products having good foaming properties, which comprises:
   1. subjecting soybean materials selected from the group of whole soybean, decoated soybean, ground soybean, soybean flakes, coarsely ground soybean and defatted soybean in powdery or flake form containing both whey component and protein to enzymatic hydrolysis, without removing the whey component, until a partially hydrolyzed product, of which the analytical value at 660 mμ showing degree of hydrolysis coming within the range of 0.4 to 0.7, is obtained;

2. heating the partially hydrolyzed product at about 90° C for 1–10 minutes, cooling to a temperature no greater than 60° C, the pH of the partially hydrolyzed product being brought to a value from 5 to 7 before or after said heating or cooling step;
3. removing precipitates formed; and
4. concentrating and/or drying the resultant solution.

4,015,020

TARTAR REMOVAL BY ELECTRODIALYSIS AND POTASSIUM LEVEL CONTROL IN WINE

Taro Nagasawa; Mamoru Tomita; Yoshitaka Tamura, all of Tokyo, and Teruhiko Mizota, Fuchi, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1975, Ser. No. 572,726

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² A27D *6/00*

U.S. Cl. 426—239 **10 Claims**

1. A method of treating wine, which comprises: introducing crude wine to both the dilution and concentration chambers of an electrodialysis apparatus; operating said apparatus so that the potassium concentration of the wine in the dilution chamber falls to below 500 mg/liter and the potassium content of the wine in the concentration chamber is increased into the range 1000 to 2000 mg/liter; cooling the wine from the concentration chamber to below 10°C and adding tartaric acid crystals to said wine in order to adjust the pH into the range 2.8 to 3.2 thereby precipitating tartar; separating the tartar from the wine and admixing said wine with wine emerging from the dilution chamber of the electrodialysis apparatus in a ratio such that the potassium content of the resulting mixture is below 500 mg/liter.

4,015,021

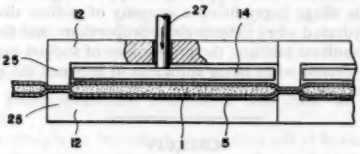
METHOD FOR PRODUCING INDIVIDUALLY WRAPPED FOODSTUFF SLICES

Eiichi Harima, c/o Miyamoto-so, No. 734, Takahata, Hiraoka-cho, Kakogawa, Hyogo, and Yosiro Okubo, No. 14-12, Akabane-kita, 3-chome, Kita, Tokyo, both of Japan

Continuation of Ser. No. 312,691, Dec. 6, 1972, abandoned. This application May 13, 1975, Ser. No. 577,052

Int. Cl.² B65B *25/06, 9/00*

U.S. Cl. 426—393 **9 Claims**



1. A method for producing a wrapped foodstuff in single slice form comprising:

extruding the foodstuff into an envelope or tube of wrapping film to form a wrapped foodstuff;

flattening the wrapped foodstuff into a continuous strip;

applying a first pressing force against said flat strip at spaced intervals to express the wrapped foodstuff from between said wrapping film at said spaced intervals and form enclosed portions of said strip between said spaced intervals to establish individually wrapped press-molded foodstuff slices of a predetermined length;

applying a second pressing force transversely against the strip in each enclosed portion after the first pressing force has been applied and while the first pressing force is retained at spaced intervals to further mold the individually wrapped foodstuff slices to a predetermined thickness;

cooling the wrapped foodstuff slices thus formed;

heat sealing the wrapping film at said spaced intervals; and cutting the wrapping film at said spaced intervals to produce individually wrapped and sealed foodstuff slices.

4,015,022

METHOD OF REDUCING THE CONTENT OF IRRITANT SUBSTANCES IN COFFEE

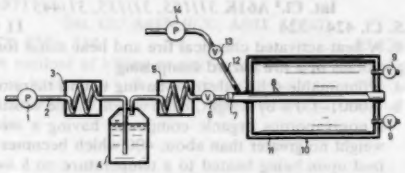
Peter A. W. Emich, deceased, late of Hamburg, Germany; by Edith G. H. Emich nee Leirmann, Hamburg, Germany; by Peter-Michael Emich, Hamburg, Germany; by Ulrich Emich, Hamburg, Germany, and by Barbara Emich, heirs, Hamburg, Germany, assignors to Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co., Hamburg, Germany

Continuation of Ser. No. 340,665, March 13, 1973, abandoned. This application July 18, 1975, Ser. No. 597,074

Claims priority, application Germany, Mar. 14, 1972, 2212171

Int. Cl.² A23F *1/04*

U.S. Cl. 426—460 **4 Claims**



1. A method of reducing the content of hydroxy tryptamides and ether soluble irritant substances in raw coffee to improve digestibility, the method comprising repeatedly first heating followed by cooling of the coffee, the heating treatments comprising continuously passing a stream of hot, humid air at about 257° F through a quantity of such coffee with the coffee maintained below the dew-point of the hot, humid air and moisture condensing on the coffee, and the cooling treatments comprising subjecting the raw coffee to cooling to about 104° F while concurrently subjecting the raw coffee to subatmospheric pressure.

4,015,023

FOODS WITH SUBSTITUTED SUCCINIC ACID COMPOUNDS

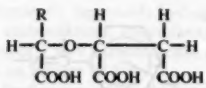
Vincent Lamberti, Upper Saddle River, and Warren J. Urban, River Vale, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 475,008, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,339, June 25, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,789

Int. Cl.² A23L *1/226*

U.S. Cl. 426—531 **9 Claims**

1. A method of imparting a tart taste to a food which comprises adding thereto a flavor enhancing amount of a compound having substantially no primate caloric value of the formula:



wherein R is hydrogen or methyl.

4,015,024

AROMATIZING TEA WITH GERANYL ACETONE AND δ-DECALACTONE

Ian Horman, Corseaux, and Paul Cazenave, Chavornay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour-de-Peilz, Switzerland

Division of Ser. No. 519,627, Oct. 31, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,979

Claims priority, application Switzerland, Nov. 23, 1973, 16515/73

Int. Cl.² A23F *3/00*; A23L *1/221*, *1/226*

U.S. Cl. 426—536 4 Claims

1. An aromatising agent for enhancing soluble tea solids consisting essentially of geranyl acetone and δ-decalactone wherein said geranyl acetone and δ-decalactone are in a ratio of 1:1 to 1:2 relative to each other.

4,015,025

HYDROCOLLOIDS AS POTENTIATORS OF DIMETHYL SULFIDE FLAVOR

Alina Surmacka Szczesniak, Mount Vernon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,956

Int. Cl.² A23L *1/226*

U.S. Cl. 426—575 4 Claims

1. A method of potentiating the flavor of dimethyl sulfide in foodstuffs which are consumed in the moist or liquid state which method comprises combining alginate with dimethyl sulfide in a respective weight ratio of from about 10:1 to about 120:1 alginate to dimethyl sulfide, in combination with the foodstuff, the dimethyl sulfide thereby being enhanced in flavor in the moist or liquid foodstuff.

4,015,026

PROCESS FOR PREPARING A MOIST PET FOOD ADDITIVE, THE ADDITIVE, AND THE RESULTANT PET FOOD

Morris P. Burkwall, Jr., Marengo; Carl D. Engstrom, Elmwood Park, and Robert F. Snyder, Hoffman Estates, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 14, 1975, Ser. No. 604,654

Int. Cl.² A23C *19/12*; A23L *1/32*; A23K *1/10*

U.S. Cl. 426—582 18 Claims

1. In a moist pet food comprising:

a. at least 50% moisture;

b. 10 to 90% of at least one component selected from the group consisting of meat and meat by-products;

c. 0 to 20% meat meal;

d. 0 to 25% vegetable or cereal products; and

e. a visible amount of simulated cottage cheese pieces—the percentages of (a) through (e) being based on the weight of the moist pet food, the improvement comprising:

the simulated cottage cheese pieces being retort stable and having a composition consisting essentially of:

A. about 1 to about 50% cottage cheese;

B. about 7.5 to about 40% of at least one binder selected from the group consisting of a gluten compound, egg white, and whole egg;

C. about 5 to about 70% amylaceous ingredients;

D. about 15 to about 60% moisture content;

E. 0 to about 20% of at least one protein extender selected from the group consisting of an oil seed protein and a vegetable protein;

F. 0 to about 2% white coloring; and

G. 0 to 5% of a natural or synthetic gum — all percentages of (A) through (G) being based on the weight of the simulated cottage cheese pieces.

4,015,027

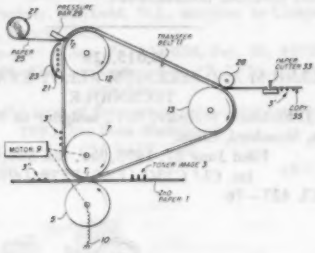
ELECTROPHOTOGRAPHIC TONER TRANSFER AND FUSING METHOD

William R. Buchan, Lincoln, Mass., and Robert A. Moore, Amherst, N.H., assignors to Itek Corporation, Lexington, Mass.

Division of Ser. No. 403,696, Oct. 4, 1973, Pat. No. 3,893,761, which is a continuation-in-part of Ser. No. 303,168, Nov. 2, 1972, abandoned. This application Feb. 20, 1975, Ser. No. 551,583

Int. Cl.² G03G *13/20*, *13/22*

U.S. Cl. 427—22 2 Claims



1. A method for transferring and fusing a non-fused toner image from a first support material to a second support material, comprising:

a. transferring a toner image from said first support material to an intermediate transfer member having a smooth elastomeric surface with a surface free energy of below about 40 dynes per centimeter, a hardness of from about 3 to about 70 durometers, said intermediate transfer member having a heat capacity of below about 3.1×10^{-3} calories/cm²/° C and being formed from a substrate coated with a layer of silicone or fluoroelastomer rubber having a thickness of from 0.1 to about 10 mils and having a thin reflecting layer therebetween, said substrate having a thickness of from about 0.5 to about 5 mils and being a material which has an ultimate tensile strength of at least about 5,000 psi and a creep of below about 3% under a load of 1,000 psi at 175° C;

b. selectively preheating the toner image on said intermediate transfer member to at least its melting point temperature; and,

c. bringing said second support material into pressure contact with the heated toner image on said intermediate transfer member in a manner sufficient to thereby transfer and fuse the toner image to said second support material.

4,015,028

METHOD FOR FORMING AN IMPROVED CONTACT FOR A RADIATION SWITCH

Dominic A. Cusano, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 490,585, July 22, 1974, Pat. No. 3,944,961. This application Oct. 20, 1975, Ser. No. 623,586

Int. Cl.² B05D *3/12*, *5/12*

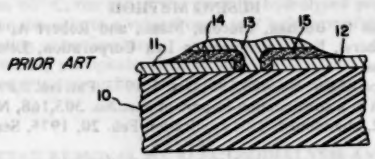
U.S. Cl. 427—58 4 Claims

1. A method of making a radiation switch comprising the steps of:

applying a pair of conductors to a non-conductive substrate;

scribing said conductors over a portion of each of said conductors to a depth sufficient to reduce heat sinking effectiveness of contact portions of said conductors; and

depositing a quantity of conductor precursor material over



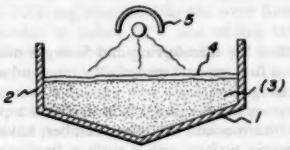
said scribed portions of said conductors and a portion of said substrate therebetween.

4,015,029

SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE

John J. Elchisak, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1975, Ser. No. 590,972
Int. Cl.² C23C *11/00*; F27B *14/10*
U.S. Cl. 427—76 12 Claims



1. A method for limiting spattering while vacuum coating one or more vaporizable inorganic photoconductive materials or components thereof onto one or more prepared substrates or bases in conjunction with at least one infra red heating device

comprising incorporating 1–80% by weight of at least one non-volatile infra red absorbing heat sink material on or within the body of said inorganic photoconductive material or components thereof prior to effecting evaporation of the materials or components.

10. A crucible for vacuum coating one or more vaporizable inorganic photoconductive materials in conjunction with at least one infrared heating means, said crucible consisting essentially of walls and a bottom element of non-contamination heat resistant materials and a plurality of non-volatile infrared absorbing rods, baffles or projections of the same or different materials arranged at an angle of 90° or less to the horizontal.

4,015,030

PROCESS FOR STABILIZATION OF FERROMAGNETIC MATERIAL AND MAGNETIC RECORDING MEMBER

Koji Sasazawa; Yasuyuki Yamada; Tatsuji Kitamoto, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 30, 1975, Ser. No. 591,681
Claims priority, application Japan, June 28, 1974, 49-74005
Int. Cl.² H01F *10/02*
U.S. Cl. 427—130 9 Claims

1. A process for stabilizing the magnetic properties of a ferromagnetic material which comprises heat-treating a needle-like ferromagnetic material having the formula FeO_x and containing at least 0.5 atom % of cobalt wherein x is the degree of oxidation and ranges from 1.36 to 1.47 at a temperature of at least about 40° to 80° C for a time sufficient to achieve the stabilization of said magnetic properties.

6. A process for stabilizing the magnetic properties of a magnetic recording member which comprises providing a ferromagnetic recording layer comprising (1) a ferromagnetic powder represented by the formula FeOx and containing at least 0.5 atom % of cobalt wherein x is the degree of oxidation and ranges from 1.36 to 1.47 and (2) a binder, on a support, and heat-treating said ferromagnetic recording layer at a temperature of at least about 40° to 80° C for a time sufficient to achieve the stabilization of said magnetic properties.

4,015,031

PROCESS FOR HYDROPHOBIZING SILICAS AND SILICATES WITH ORGANOSILANES

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Feb. 2, 1976, Ser. No. 654,707
Claims priority, application Germany, Mar. 27, 1975, 2513608
Int. Cl.² B05D *1/00, 7/00*
U.S. Cl. 427—213 9 Claims

1. In a process for hydrophobization of finely divided silica or silicate by treatment of dry moving particles of powdery silica or silicate produced by wet precipitation or pyrogenically with an organosilane at an elevated temperature the improvement comprising stirring the silica or silicate in a container at about 200° to 300° C. to bring the silica or silicate to a fluidized condition and while the silica or silicate is in said fluidized condition at said temperature treating the silica or silicate dropwise with an organosilane which is stable at said temperature and boils below 300° C., said organosilane having an active group which will react with the surface of the silica or silicate to be hydrophobized.

4,015,032

METHOD OF WAXING CARS

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

Filed Apr. 28, 1975, Ser. No. 572,093
Int. Cl.² B05D *1/38, 3/12, 7/14*
U.S. Cl. 427—327 7 Claims

1. The method of waxing and polishing cars comprising:

applying an aqueous emulsion of wax in a foam state to a car,

polishing the foam wax on the car while wet to form a wet, polished wax coating thereon,

and applying a self-polishing wax to the wet waxed coating.

4,015,033

LAMINATES OF ACRYLONITRILE/STYRENE COPOLYMERS

Eric Nield, Watton-at-Stone, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 330,463, Feb. 7, 1973, abandoned.
This application Mar. 6, 1975, Ser. No. 555,834
Claims priority, application United Kingdom, Feb. 24, 1972, 8567/72; Jan. 17, 1973, 2397/73; Feb. 24, 1972, 8568/72
Int. Cl.² B32B *27/08*
U.S. Cl. 428—35 6 Claims

1. A process for making a thick-walled laminated tube for blow-forming into a laminated moulded container which comprises the step of simultaneously melt extruding

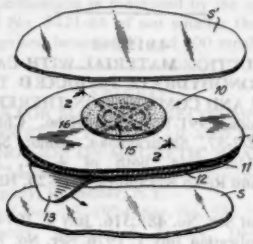
i. a thermoplastic polymer comprising a homogeneous copolymer of acrylonitrile in a molar unit concentration of from 86% to 90% and styrene, with

ii. another thermoplastic polymer, so as to produce a laminated moulded container said polymers being melt-extruded into a tubular laminate suitable for blow-forming into a laminated moulded container.

4,015,034
REGISTER FOR INDEX MARKING ARTICLE

Benjamin Edward Smolen, 1501 Broadway, New York, N.Y. 10036

Continuation-in-part of Ser. No. 693,496, June 7, 1976, abandoned. This application Aug. 23, 1976, Ser. No. 716,788
Int. Cl.² B32B 3/16; B44C 1/16
U.S. Cl. 428—40 8 Claims

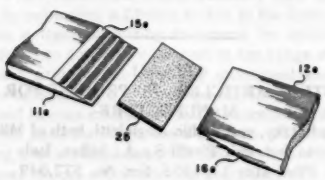


1. An article for applying an index mark and a silhouette thereof in precise registry respectively on a superimposed pair of receiver sheets between which said article is disposed comprising, in combination, a carrier sheet having a release surface, an indicia marking comprised of a coherent, opaque, discontinuous film releasibly bonded to said release surface, said film at least partially encompassing uncoated areas of said release surface, a second, continuous, opaque, readily frangible marking disposed in registry with said indicia marking and said encompassed areas, said second marking being firmly adherent to said encompassed areas of said release surface and to the films of said indicia marking, and an adhesive layer covering said second marking whereby, when said adhesive layer is secured to a receiver sheet and said carrier sheet peeled away from said receiver sheet, said adhesive, said first indicia marking, and the portions of said second marking in registry with said first marking will be transferred to said receiver sheet and the portions of said second marking in registry with said encompassed areas will remain on said carrier.

4,015,035
METHOD OF FORMING FIBER-REINFORCED EPOXY COMPOSITE JOINTS, AND PRODUCT THEREOF

Leiv H. Blad, Van Nuys, and Robert F. Warkow, Granada Hills, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 279,703, Aug. 10, 1972, Pat. No. 3,885,071. This application Dec. 9, 1974, Ser. No. 530,523
Int. Cl.² B32B 3/10, 5/12; B29C 17/08; B65H 69/02
U.S. Cl. 428—60 16 Claims



1. In a method of producing an improved joint wherein at least one element thereof is an epoxy composite adherend internally reinforced with fibers oriented in a substantially parallel relation and having a prepared mating portion including a beveled surface,

the improvement comprising the steps of removing by an etching process the epoxy matrix of the adherend at the beveled surface of the mating portion to expose lengths of its reinforcing fibers, and

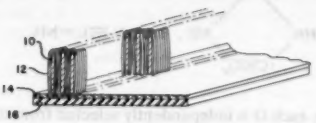
utilizing an unsupported adhesive material between the etched mating surface portion of such adherend and an element to be joined to said adherend,

whereby subsequent bonding of such adherend, adhesive, and the joined element provides for the intermeshing and contiguity of the lengths of fibers between such joined adherend and element to produce an improved joint.

4,015,036
BONDED CARPETING

Laurence F. Haemer, Fairfield, N.J., assignor to Congoleum Corporation, Kearny, N.J.

Continuation-in-part of Ser. No. 444,058, Feb. 20, 1974, Pat. No. 3,947,306. This application Feb. 17, 1976, Ser. No. 658,746
The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.
Int. Cl.² B32B 5/00
U.S. Cl. 428—88 18 Claims



11. Bonded pile carpeting including:

a. a backing sheet,

b. a plurality of parallel rows of yarn tufts,

c. each of said yarn tufts within a row being individual and unconnected to any adjacent yarn tuft,

d. said rows including a first preselected portion in which each tuft therein is formed from a single first yarn and a second preselected portion in which each tuft is formed from a single second yarn.

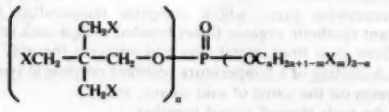
4,015,037
DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, and James A. Albright, both of Ann Arbor, Mich., assignors to Michigan Chemical Corporation, Chicago, Ill.

Filed Mar. 22, 1976, Ser. No. 660,520
Int. Cl.² C09D 1/00
U.S. Cl. 428—245 47 Claims

1. A flame retardant testile finish comprising:

a. from about 16 percent to about 30 percent of a flame retardant compound of the formula



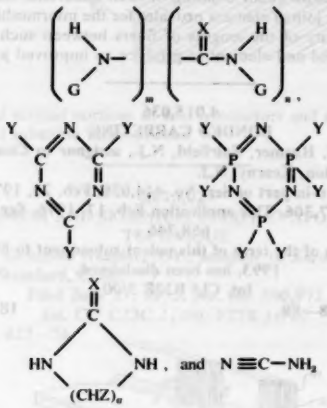
wherein each X is independently selected from chlorine, bromine, and hydrogen, wherein *a* is an integer from 1 to 2, wherein *n* is an integer from 1 to 8, and wherein *m* is an integer from 0 to *n*, provided that when *n* is 1, *m* is 0;

b. from about 3.2 percent to about 4.8 percent of a substantially water immiscible organic solvent characterized by having a flash point of at least 80° F. and a boiling point within the range of from about 300° to about 350° F.;

c. from about 3.2 percent to about 4.8 percent of an emulsifying agent possessing a hydrophile lipophile balance value of from about 10 to about 14;

d. from about 27 percent to about 41 percent of a water soluble quaternary phosphonium salt;

e. from about 10 percent to about 15 percent of a water soluble organic nitrogen containing compounds selected from the group consisting of



wherein each G is independently selected from the group comprising hydrogen, hydroxymethyl, alkyl containing up to 6 carbon atoms, amino, and cyano; X is selected from the group comprising oxygen, sulfur, =NH, and =NC N; *m* is an integer from 0 to 1; *n* is an integer from 1 to 2 with the provision that $m+n$ equals 2; *a* is an integer from 2 to 3; each Y independently is —NHG wherein G is defined above; and Z is selected from the group comprising hydrogen and hydroxyl; and

f. from about 20 percent to about 31 percent of water.

4,015,038

NOVEL HIGH TEMPERATURE RESISTANT FABRICS

Eric R. Romanski, Delmar; J. Drew Horn, Kinderhook, and William H. Dutt, Rensselaer, all of N.Y., assignors to Albany International Corporation, Albany, N.Y.

Continuation-in-part of Ser. No. 420,431, Nov. 30, 1973, Pat. No. 3,871,946. This application Feb. 24, 1975, Ser. No. 552,765

The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² B32B *5/02;* **D03D** *19/00*

U.S. Cl. 428—255 **12 Claims**

1. An endless dryer belt which comprises a highly air permeable, temperature resistant leno weave fabric having

i. warp yarns comprising temperature resistant synthetic organic fibers;

ii. crosswise yarns which comprise temperature resistant synthetic organic fibers braided over a core selected from glass fiber, metal wire and mixtures thereof;

iii. A coating of a temperature resistant polymeric synthetic resin on the yarns of said weave; and

iv. the ends thereof joined together.

4,015,039

FIBROUS DISPERSION AID FOR THERMOPLASTICS

Leon Segal, Morristown, and Albert H. Steinberg, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 375,430, July 2, 1973, Pat. No. 3,931,094. This application Sept. 2, 1975, Ser. No. 609,463

Int. Cl.² B32B *5/26, 5/28*

U.S. Cl. 428—297 **11 Claims**

1. A filled thermoplastic resin sheet formable by stamping under heat and pressure into shaped objects wherein the sheet is a laminate comprising:

a. at least one layer of a filled thermoplastic composition comprising 15–80% filler and, as a dispersion effecting aid, 0.5–15% fibrous material having an aspect ratio at least about 10 times the aspect ratio of the filler and having a length of less than about ⅛ inch; and

b. at least one layer of glass mat formed of fiber lengths of at least 1.5 inches in length.

4,015,040

CONSTRUCTION MATERIAL WITH CALCIUM SILICATE MONOHYDRATE PRODUCED THEREON IN SITU AND COMPOSITION THEREFOR

Akitoshi Yoshida, 991-176, Yahagicho, Chiba; Koichiro Yanagida, 2-7-57, Sakuragaoka, Mino; Shigeki Inoue; Tadanobu Maruyama, both of 4-311, Narashinocho, Funabashi, and Reiko Nakamura, 1-18-20, Hirai, Tokyo, all of Japan

Continuation of Ser. No. 485,316, July 2, 1974, abandoned. This application July 1, 1976, Ser. No. 701,878

Claims priority, application Japan, July 4, 1973, 48-74898

Int. Cl.² B32B *5/16, 5/18, 5/28;* **C08L** *31/04*

U.S. Cl. 428—310 **8 Claims**

1. A construction material covered with a film composition on a construction object containing calcium silicate monohydrate, $2CaO.SiO_2.H_2O$, produced in situ by reacting a coating with a calcium compound in the presence of water, said calcium compound selected from the group consisting of calcium hydroxide, calcium halide, calcium nitrate, calcium nitrite, calcium carbonate, calcium oxide, calcium sulfate, calcium silicate, calcium phosphate, and calcium salts of organic acids, said coating being formed from a coating material which comprises a silica sol dispersed in a medium selected from the group consisting of water, methanol, ethanol isopropanol and a mixture thereof, at least one kind of aggregate, at least one kind of viscosity increasing agent selected from the group consisting of polyacrylic acid and sodium polyacrylate, at least one kind of organic polymer, as an aqueous emulsion, selected from the group consisting of polyvinylacetate and polyacrylate, and pigment, said silica sol containing 5 to 50% by weight of SiO_2 and having a mol ratio SiO_2/Me_2O, wherein Me represents monovalent alkali metal atom, of more than 25.

6. A film composition for coating construction materials comprising calcium silicate monohydrate, $2CaO.SiO_2.H_2O$, produced in situ by reacting a calcium compound in the presence of water with a silica sol dispersed in a medium of at least one of the group consisting of water, methanol, ethanol, isopropanol and t-butanol, containing 5 to 50% by weight of SiO_2 and having a mole ratio, SiO_2/Me_2O, wherein Me represents monovalent alkali metal atom, of more than 25, in the presence of at least one kind of aggregate, at least one kind of viscosity increasing agent selected from the group consisting of polyacrylic acid and sodium polyacrylate, at least one kind of organic polymer, as an aqueous emulsion, selected from the group consisting of polyvinylacetate and polyacrylate, and pigment.

4,015,041

UPHOLSTERY ARTICLES AND PROCESS FOR THEIR MANUFACTURE

Bruno Koschatzky, and Attilio Angioletti, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed May 13, 1975, Ser. No. 577,049

Claims priority, application Italy, July 12, 1974, 25120/74

Int. Cl.² B32B *3/26*

U.S. Cl. 428—310 **1 Claim**

1. In a molded cellular polyurethane upholstery article comprising an inner core of flexible cellular polyurethane and a preformed flexible polyurethane skin which is mechanically resistant and which presents an appealing appearance, wherein said skin is microporous and is directly joined to the

inner core by a chemical bond, has cells substantially uniformly distributed within its thickness in a fine cellular structure, said cells being predominantly cells which do not communicate with each other, said skin having a density between 0.4 and 0.8 g/cm³, the improvement consisting in that at least the useful surface of said skin is internally supported by a piece of net fabric made of fibers selected between natural, artificial and synthetic fibers disposed in the said article between said skin and said inner core, said net fabric having a resistance to perforation as measured by the sphere method, UNI Standard No. 5421-64 of not smaller than 8 kg and a thickness comprised between 20 and 100 meshes per dm.

4,015,042
MATERIALS FOR MAGNETIC RECORDING HAVING HIGH RESISTANCE TO WEAR AND REDUCED ABRASION ON MAGNETIC HEADS

Yves Gilbert Chassaigne, Paris, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,755

Claims priority, application France, Dec. 28, 1973, 73.46716

Int. Cl.² B32B *5/16*

U.S. Cl. 428—325 **19 Claims**

1. In an element comprising a non-magnetic support and a magnetic recording layer having dispersed in a binder, (1) ferromagnetic particles and (2) non-ferromagnetic particles that improve the wear resistance of said layer and have a Mohs Hardness above that of said ferromagnetic particles, the improvement wherein said non-ferromagnetic particles consist essentially of a bimodal distribution of (a) particles and (b) particles, said (a) particles having an average particle size similar to or larger than that of the ferromagnetic particles in the range of about 0.3 to about 2 microns and being present in a concentration in the range of about 0.005 to about 0.025 parts, by weight, based on the weight of said ferromagnetic particles and said (b) particles having an average particle size up to about 0.1 micron and being present in a concentration in the range of about 0.02 to about 0.06 parts, by weight, based on the weight of said ferromagnetic particles.

4,015,043
ELECTROSTATIC RECORDING MATERIAL

Noritoshi Watanabe; Seigoro Fujita; Kazuo Shibata; Shiho Iwawaki, all of Hyogo, and Hiromu Takeda, Shiga, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd. and Toray Industries, Inc., both of Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,379

Claims priority, application Japan, Sept. 9, 1974, 49-103703

Int. Cl.² D21H *3/42, 3/46, 3/38*

U.S. Cl. 428—342 **13 Claims**

1. An electrostatic recording material comprising an electroconductive transparentized base sheet having a dielectric layer thereon in an amount within the range of from 3 to 20 g/m² on a dry basis, said transparentized base sheet being obtained by subjecting a fibrous matrix in the form of a sheet mateial to a transparentizing treatment by moistening the sheet material to a moisture content in the range of from 5% to 40% and pressing the resulting moistened sheet with a pressing means having a press surface temperature of at least 130° C, said fibrous matrix consisting essentially of:

a. 6 to 60 parts by weight on a dry basis of synthetic pulp having a microfibril structure and formed of a blended polymer system which consists essentially of 5 to 40% by weight of polyvinyl alcoholacrylonitrile copolymer in which the polyvinyl alcohol component is chemically bonded to acrylonitrile component and the polyvinyl alcohol component content is 20 to 80% by weight, and 60 to 95% by weight of acrylonitrilestyrene copolymer in which the acrylonitrile component content is 5 to 45% by weight; and

b. 94 to 40 parts by weight on a dry basis of natural pulp.

4,015,044
PROCESS OF BONDING POLYURETHANE-SEALANTS AND CAULKS

Maurice W. Ranney, Rockland, and Robert J. Pickwell, Westchester, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,778

Int. Cl.² C07C *149/00;* **B32B** *27/40*

U.S. Cl. 428—419 **10 Claims**

1. The process of enhancing the bonding of polyurethane sealants and caulk compositions to solid inorganic surfaces which comprises providing at the interface of the caulk or sealant composition and said surface a silane, or the hydrolyzate or condensate of silane, having the formula:

$$(S_n)_a[R - SiX_3]_b$$

wherein *n* is a number ranging from about 2 to about 6, *a* is a number equal to one-half the free valence of R, *b* is a number equal to at least 2, R is a divalent organic radical joined at one end to sulphur and at the other end to silicon, and X is a hydrolyzable group comprised of halogen, alkoxy or acyloxy radicals.

4,015,045
CHEMICAL STRENGTHENING OF GLASS

Dale W. Rinehart, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 432,006, Jan. 9, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,108

Int. Cl.² B32B *17/00;* **C03C** *21/00*

U.S. Cl. 428—410 **2 Claims**

2. A chemically strengthened glass article exhibiting a surface compressive stress after being subjected to surface abrasion composed of an interior portion which is in tension and a surface compressive layer, said interior portion comprising a base glass consisting essentially by weight on the oxide basis of about:

Component	Percent by Weight
SiO_2	[50–58] 52–57
Na_2O	[8–23] 10–19
K_2O	[0–15] 0–10
$Na_2O + K_2O$	[13–25] 17–23
Al_2O_3	[7–17] 9–13
ZrO_2	[1–4.5] 2–4.5
$Al_2O_3 + ZrO_2$	[10–21] 12–17
[CaO]	[0–10]
MgO	[0–6.5] 4–6
[CaO + MgO]	[2.5–10]
TiO_2	[0–7] 1–6
$[TiO_2 + (MgO + CaO)]$	[4–14]

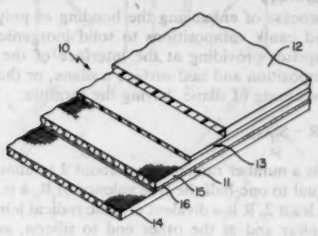
wherein the glass includes less than 0.1 percent by weight Li_2O and the above components constitute at least 95 percent by weight of the base glass composition and are proportioned relative to one another so as to provide a base glass having a viscosity of 100 poises at a temperature less than 2800° F. and a viscosity of 10,000 poises at a temperature less than 2050° F., and having a working range of at least 125° F.; said surface layer having a composition chemically altered from that of the base glass to the extent that the surface layer has a lesser content of sodium with a correspondingly greater content on an ionic basis of a monovalent alkali metal ion having a larger ionic diameter than sodium.

4,015,046

PRINTING BLANKET AND METHOD OF MAKING SAME

Melvin D. Pinkston, Waynesville, and Robert L. Hartenstein, Canton, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Feb. 23, 1976, Ser. No. 660,750
Int. Cl.² B41N 9/00; B32B 31/04, 27/00
U.S. Cl. 428—422 **19 Claims**



1. A printing blanket comprising a base structure, a surface layer made of a fluorocarbon elastomer, and a binder layer; said binder layer being comprised of 100 parts of polychloroprene elastomer, 5 to 20 parts of a resin binder, and 30 to 50 parts of a hydrated silica, said binder serving as an exciter and said hydrated silica serving as a vehicle in said binder layer, said binder layer providing a tenacious bond and optimum adhesion between said surface layer and said base structure.

19. A method of making a printing blanket comprising the steps of forming a base structure, applying on said base structure a binder layer comprised of a polychloroprene elastomer having adhesion promoters therein, said binder layer being compounded from materials comprising at least 50 parts by weight of polychloroprene elastomer, 5 to 20 parts by weight of resin binder, and 30 to 50 parts by weight of hydrated silica, and disposing a surface layer made of a fluorocarbon elastomer on said binder layer by building up consecutive thin layers until a desired thickness for said surface layer is attained.

4,015,047

POLYURETHANE SEALANT AND CAULK SYSTEMS

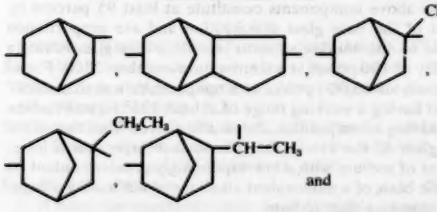
Maurice W. Ranney, Rockland, and Robert J. Pickwell, Westchester, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,776
Int. Cl.² B05D 1/36, 5/10; B32B 27/06, 27/40
U.S. Cl. 428—425 **2 Claims**

1. The process for enhancing the bonding of polyurethane sealant or caulks to solid inorganic substrates which comprises providing at the interface of the substrate and the sealant or caulk a silane or its hydrolyzate or condensate of the formula

$$(HS)_b\text{-}R''\text{-}Six_3$$

in which *b* is 1 or 2, X is a hydrolyzable group comprised of chlorine, alkoxy or acetoxy radicals, R'' is one of the polyvalent cycloaliphatic hydrocarbon radicals of the formula



and

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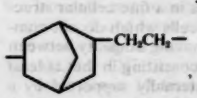


and when *b* is two, the two mercapto groups are attached to separate carbon atoms and such carbon atoms are adjacent to one another.

4,015,048

CERAMIC ARTICLES HAVING CORDIERITE COATINGS

Francis W. Martin, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,655
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² C03C 3/22, 12/00
U.S. Cl. 428—428 **10 Claims**

1. A ceramic article having on at least a portion of the surface thereof a non-porous sintered cordierite glass-ceramic coating, wherein

a. said coating has an oxide composition consisting essentially, in mole percent, of about 22.2–26 mole percent MgO, 23.6–27.8 mole percent Al_2O_3, 44.3–52.7 mole percent SiO_2, 0.7–5.6 mole percent MO, wherein MO is one or more modifying oxides selected from the group consisting of BaO, PbO, SrO and CaO, and at least 23.6 mole percent total of (MO + MgO), said Al_2O_3 being present in an amount which exceeds the amount of said modifying oxides by about 21–23 mole percent,

b. said coating contains crystals of a structure corresponding to hexagonal cordierite as the sole crystal phase, being essentially free of residual glass and the secondary crystal phases magnesia quartz, sapphirine and celsian; and

c. said coating is provided by heating a glass powder coating having said oxide composition at a temperature in the range of about 900°–1050°C. for a time sufficient to obtain the sintering and crystallization thereof.

5. A glass-ceramic article having on at least a portion of the surface thereof a nonporous, sintered cordierite glass-ceramic coating, wherein

a. said coating has an oxide composition consisting essentially in mole percent, of about 22.2–26 mole percent MgO, 23.6–27.8 mole percent Al_2O_3, 44.3–52.7 mole percent SiO_2, 0.7–5.6 mole percent MO, wherein MO is one or more modifying oxides selected from the group consisting of BaO, PbO, SrO, and CaO, and at least 23.6 mole percent total of (MO + MgO), said Al_2O_3 being present in an amount which exceeds the amount of said modifying oxides by about 21–23 mole percent,

b. said coating contains crystals of a structure corresponding to hexagonal cordierite as the sole crystal phase, being essentially free of residual glass and the secondary crystal phases magnesia quartz, sapphirine and celsian; and

c. said coating is provided by heating a glass powder coating having said oxide composition at a temperature in the range of about 900°–1050°C. for a time sufficient to obtain the sintering and crystallization thereof.

4,015,049

METAL COATED UNSATURATED CARBOXYLIC ACID MODIFIED POLYOLEFIN ARTICLE AND METHOD OF MAKING SAME

Makoto Yoda, Kawagoe; Kazushige Ishibashi, Ohi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1975, Ser. No. 575,054

Claims priority, application Japan, May 9, 1974, 49-50704

Int. Cl.² B05D *3/02*; B32B *15/08*; C23C *13/02*

U.S. Cl. 428—461 21 Claims

1. A method of forming a metallic layer on the surface of a polyolefin which comprises vapor depositing in a vacuum a metallic layer on a polyolefin article modified by 0.002 to 3 mole percent of one or more unsaturated fatty acids or their functional derivatives and then subjecting the composite article so formed to a heat treatment at a temperature 5° C. to 70° C. lower than the melting point of the polyolefin.

7. A composite article comprising a metallic layer on a polyolefin film made by the process of claim 1.

4,015,050

PLASTICS FILM WITH AN ALUMINIUM PHOSPHATE COATING

James Derek Birchall, Norley, and John Edward Cassidy, Hartford, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 42,499, June 1, 1970. This application Dec. 10, 1971, Ser. No. 206,910

Claims priority, application United Kingdom, Dec. 11, 1970, 59021/70

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.² B32B *27/06*, *27/36*

U.S. Cl. 428—480 7 Claims

1. A glass like coated, organic, plastics film having a coating on at least one surface of said film of aluminium phosphate derived from a solution of a halogen-containing complex phosphate of aluminium containing at least one chemically bound molecule of a hydroxy compound R-OH wherein R is a hydrogen atom or an organic group.

4,015,051

POLYETHYLENE PACKAGING FILM

Richard A. Offermann, Countryside, and Robert J. Vorrier, Palos Hills, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,591

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B32B *27/32*; B06D *3/02*

U.S. Cl. 428—523 8 Claims

1. A transparent, flexible thermoplastic polyethylene packaging film having a thin transparent coating consisting essentially of a film-forming polyester resin applied to at least a portion of one surface thereof in an amount of at least 0.081 gms. of polyester resin per sq. meter of film and not more than an amount which would affect the transparency and flexibility of said film, said resin coated surface remaining transparent and being readily separable from contiguous surfaces of thermoplastic film after heating at temperatures employed in heat-shrinking thermoplastic film.

4,015,052

FUEL CELL

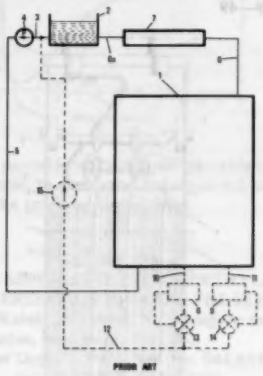
Jacques Cheron, Maisons-Lafitte, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, France

Filed Sept. 30, 1975, Ser. No. 617,993

Claims priority, application France, Sept. 10, 1974, 74.34193

Int. Cl.² H01M *8/04*

U.S. Cl. 429—14 5 Claims



1. In a fuel cell system including:

a fuel cell block defining at least one fuel cell, said fuel cell block being provided with a first group of chambers for receiving electroltye, a second group of chambers for receiving fuel and a third group of chambers for receiving comburent, each group of chambers having respective inlet and outlet orifices for receiving and discharging the fluids passing therethrough;

an electrolyte feeding circuit defining an electrolyte recirculation flow path, said feeding circuit including an electrolyte tank, pump means for pumping electrolyte around said flow path and conduit means connecting said first group of chambers, said electrolyte tank and said pump means so that electrolyte flowing through said flow path passes in order through said first group of chambers, through said tank, through said pump means and then back to said first group of chambers;

collecting means for collecting electrolyte leaking into said second group of chambers and said third group of chambers; and

return means for returning electrolyte collected in said collecting means to said electrolyte recirculation flow path;

the improvement wherein:

1. said electrolyte tank and said fuel cell block are so arranged that the inlet orifice of said tank is above the outlet orifice of said first group of chambers;
2. said electrolyte tank and said pump means are arranged so that the outlet orifice of said tank is above the inlet orifice of said pump means;
3. said fuel cell system further includes pressure drop means interposed between said tank and said pump means producing when said pump means is pumping electrolyte through said flow path a dynamic pressure drop, the value of said dynamic pressure drop being between (a) the static pressure of the electrolyte measured between the inlet of said pump means and the electrolyte liquid level in said electrolyte tank and (b) the pressure difference between the pressure at the inlet of said pump means and the outlet of said pump means; and
4. said return means returns electrolyte from said collecting means to said flow path at a location intermedite said pressure drop means and said pump means.

4,015,053

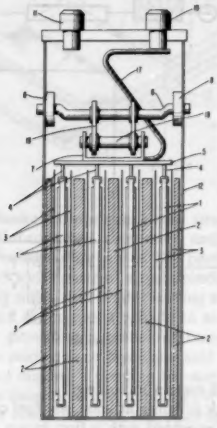
RECHARGEABLE ELECTRIC ACCUMULATOR CELL WITH AT LEAST ONE ZINC ELECTRODE

Otto von Krusenstierna, Taby, Sweden, assignor to Aktiebolaget Tudor, Sundyberg, Sweden

Continuation-in-part of Ser. No. 422,591, Dec. 6, 1973, Pat. No. 3,923,550, which is a continuation of Ser. No. 186,213, Oct. 4, 1971, abandoned. This application Dec. 1, 1975, Ser. No. 636,603

Int. Cl.[2] H01M 4/29, 4/42

U.S. Cl. 429—49 4 Claims



1. A rechargeable electric accumulator cell comprising at least one cathode, at least one zinc anode part and a separator part disposed between each said cathode and zinc anode part arranged in a liquid alkaline electrolyte, vibratory means operatively connected with at least one said part to subject said part to a vibratory movement in the direction of the plane of the part, wherein the said electrolyte contains zinc in an amount of from about 250 to 60 grams of zinc per liter of electrolyte when the cell is discharged, which amount is in excess of that soluble in the electrolyte whereby solid zinc oxide is contained in the electrolyte of the fully charged cell.

4,015,054

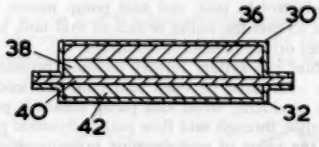
ELECTROLYTIC CELLS

Brian Cleaver, Eastleigh, and Geoffrey John Rowlands, Chelmsford, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 18, 1975, Ser. No. 605,325

Int. Cl.[2] H01M 43/00

U.S. Cl. 429—104 11 Claims



1. An electrolyte cell comprising:
a. an anode formed of a material including lithium,
b. a ceramic electrolyte selected from the group consisting of β alumina and β'' alumina,
c. a cathode containing a chalcogen, and
d. a salt containing lithium ions which salt is interposed between the anode and the electrolyte.

4,015,055

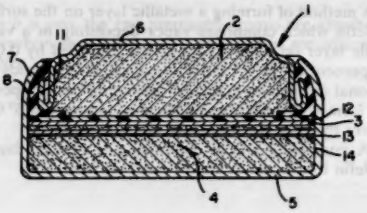
METAL OXIDE CELLS HAVING LOW INTERNAL IMPEDANCE

Richard Allen Langan, Parma; Nicholas Joseph Smilanich, Rocky River, and Akiya Kozawa, Middleburg Heights, all of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,636

Int. Cl.[2] H01M 6/06

U.S. Cl. 429—145 13 Claims



1. In a metal oxide alkaline cell comprising a negative electrode, a positive electrode housed in an electronically conductive container having a bottom and a side wall, a separator disposed between said negative electrode and said positive electrode, and an electrolyte, said positive electrode comprising a metal oxide wherein the improvement comprises a layer of electronically conductive material selected from the group consisting of gold, platinum, rhodium, palladium, lead, tungsten, tantalum, nickel, iron disulfide and lead oxide, said electronically conductive material being disposed solely at the interface of the separator and the positive electrode and extending sufficiently to contact the wall of the conductive container so as to decrease the internal resistance at the separator-cathode-cathode collector interfaces and thereby substantially eliminate the voltage variations usually associated with the initial discharge of metal oxide cells and said electronically conductive material being sufficiently porous so as not to effectively interface with the ionic flow between the negative and positive electrodes of the cell.

4,015,056

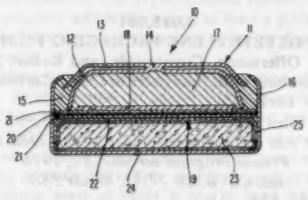
METHOD OF MANUFACTURING A STABLE DIVALENT SILVER OXIDE DEPOLARIZER MIX

El Sayed Megahed, Madison, and Patrick Joseph Spellman, Middleton, both of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,656

Int. Cl.[2] H01M 6/06

U.S. Cl. 429—219 18 Claims



1. A method for manufacturing a stable divalent silver oxide depolarizer mix which comprises (1) forming a divalent silver oxide depolarizer mix containing divalent silver oxide, (2) compressing the depolarizer mix in a press to form a depolarizer mix pellet, (3) treating the depolarizer mix pellet with a mild reducing solution which is sufficiently mild that no substantial portion of the divalent silver oxide is reduced to silver under the treatment conditions, (4) consolidating the treatment depolarizer mix pellet in a cathode container by com-

pressing it in the container, and (5) treating the consolidated depolarizer mix/cathode container assembly with a strong reducing solution to form a substantially continuous and electrolyte permeable layer of silver on the exposed surface of the depolarizer mix.

4,015,057
ABRASION RESISTANT FLUOROOLEFIN COATING COMPOSITION

Walter George Gall, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 415,665, Nov. 14, 1973, abandoned. This application June 2, 1975, Ser. No. 582,793
Int. Cl.² C08K *5/05, 5/07*
U.S. Cl. 526—30 **5 Claims**

1. A thermally curable coating composition comprising a solution in a compatible solvent of an esterification catalyst and

I. an aliphatic carboxylic acid containing at least four carboxyl groups and having at least four carbon atoms in its chain and in which the carbon chain may be interrupted by oxygen or sulfur atoms, said acid being free of ester groups, and

II. a fluoroolefin copolymer of the fluoroolefin of the formula $CFX = CX'X''$, wherein X is hydrogen or fluorine, X' is hydrogen, fluorine or chlorine and X'' is hydrogen, chlorine, fluorine, lower perfluoroalkyl or lower perfluoroalkoxy, and a vinyl ether compound of the formula $CH_2 = CHOR$ wherein R is an alkyl or oxyalkyl group of up to 13 carbon atoms which contains at least one hydroxyl group, said fluoroolefin copolymer having a ratio of fluorine atoms to hydroxyl groups of between 1:1 and 22:1, said copolymer containing between about 6 and about 65% by weight fluorine and having a number average molecular weight of about from 30,000 to 80,000 and a weight average molecular weight of about from 350,000 to 550,000;

wherein the amount of acid present in said solution is such that the number of carboxylic groups is at least about equal to and as high as about twice the number of hydroxyl groups present in the copolymer wherein the copolymer and the acid are dissolved in the solvent or solvent mixture in an amount sufficient to provide a solution viscosity which is suitable for coating operations and wherein the solvent is substantially inert to the fluoroolefin copolymer and the aliphatic carboxylic acid.

4,015,058
COMPOSITION WITH DICUMYL PEROXIDE AND PROCESS FOR AVOIDING SCORCHING OF ETHYLENE POLYMER COMPOSITION

Donald Lincoln Schober, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 527,852, Nov. 27, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,774
Int. Cl.² C08F *8/06, 8/00*
U.S. Cl. 526—57 **18 Claims**

10. A process for preventing the scorching of a vulcanizable composition which is susceptible to scorching during the processing thereof at temperatures of about 120° to 160° C. prior to the intended vulcanization thereof,

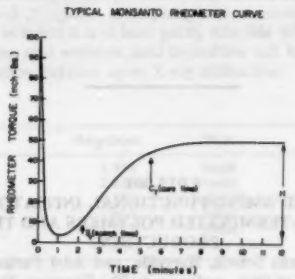
said composition comprising, in weight ratio,

100 parts by weight of ethylene polymer, and

about 0.1 to 5.0 parts by weight of dicumyl peroxide,

which comprises,

admixing into said composition, prior to said processing, sufficient amounts of at least one hydroperoxide selected from the group consisting of cumene hydroperoxide and tertiary butyl hydroperoxide as to increase the efficiency factor of said compositions at least about 3 units when said efficiency factor is determined on the basis of rheometer curves obtained from a Monsanto Rheometer at a cure temperature of 360° F. using a rheometer oscillation of 110 CPM and an arc of ± 5°,



said dicumyl peroxide and said hydroperoxide being used in a weight ratio, to each other, of about 4:1 to 40:1, and vulcanizing the resulting composition.

4,015,059
FUSED RING CATALYST AND ETHYLENE POLYMERIZATION PROCESS THEREWITH

Fredrick John Karol, Bellemead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

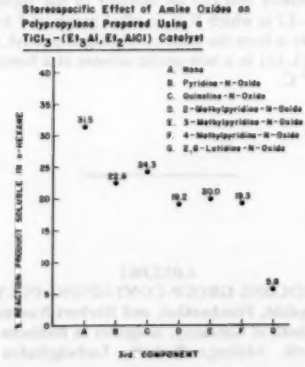
Filed Dec. 29, 1975, Ser. No. 644,814
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—130 **23 Claims**

1. An olefin polymerization catalyst which comprises, supported on activated inorganic oxide, organochromium compound of the structure Ar—Cr II — Ar' wherein Ar and Ar' are the same or different and are indenyl or fluorenyl radicals which are unsubstituted or substituted with C_1 to C_{10}, inclusive hydrocarbon radicals.

4,015,060
CATALYST AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Nicholas M. Karayannis, Hinsdale; James A. Turner, Naperville, and Sam S. Lee, Hoffman Estates, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 8, 1971, Ser. No. 196,335
Int. Cl.² C08F *4/66, 10/06*
U.S. Cl. 526—141 **1 Claim**



1. In the process of forming highly-crystalline polypropylene or highly-crystalline terminal block or pure block copolymers of propylene with ethylene or another alpha-olefin with up to 10 carbon atoms using a catalyst comprised of (a) a dialkylaluminum halide, (b) a titanium trichloride, and (c) an amine oxide, the improvement which consists essentially of

using for (c) about two to about eight mol percent, based upon the amount of said dialkylaluminum halide present, of 2,6-lutidine-n-oxide.

4,015,061

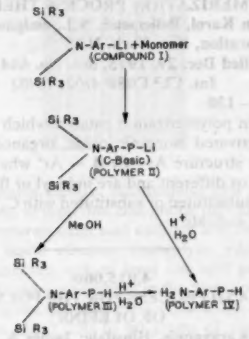
PROTECTED AMINO-FUNCTIONAL INITIATORS AND AMINO-TERMINATED POLYMERS AND THEIR PRODUCTION

Donald Norman Schulz, Hartville, and Adel Farhan Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, OhioH

Continuation-in-part of Ser. No. 550,237, Feb. 14, 1975, abandoned, which is a continuation of Ser. No. 442,695, Feb. 15, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,801

Int. Cl.² C08F *4/48, 8/12, 12/08, 36/14*

U.S. Cl. 526—178 **7 Claims**



1. The method of producing a terminally functional lithium-termnated polymer which comprises (a) reacting a monomer from the class consisting of (1) conjugated dienes containing 4 to 8 carbon atoms, (2) mixtures of such conjugated dienes and (3) a mixture copolymer of such a conjugated diene and a vinyl monomer and (b) an initiator of the formula $(SiR_3)_2$—N—Ar—Li in which R is an alkyl group of 1 to 8 carbon atoms and Ar is from the class consisting of phenyl, tolyl, xylyl and naphthyl, (c) in a non-protic solvent at a temperature of −50 to 100° C.

4,015,062

DIOXAZOLONE GROUP-CONTAINING POLYMERS

Heinz Eilingsfeld, Frankenthal, and Herbert Naarmann, Wattenheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

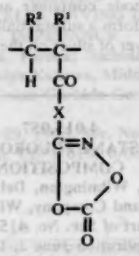
Filed Sept. 29, 1975, Ser. No. 617,783

Claims priority, application Germany, Oct. 4, 1974, 2447370

Int. Cl.² C08F *120/26*

U.S. Cl. 526—260 **5 Claims**

1. A polymer containing units of the formula:

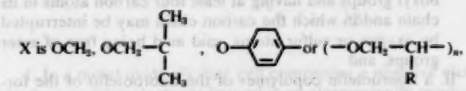


wherein:

R^1 is hydrogen or methyl;

R^2 is H; and

X is OCH_2,



where *n* is an integer of from 1 to 50 and R is hydrogen, alkyl, cycloalkyl or aryl.

4,015,063

CRUDE OILS AND RESIDUAL FUEL OILS CONTAINING A TERPOLYMER OF ETHYLENE, VINYL ESTER, AND DIALKYLVINYL CARBINOL

Robert J. Basalay, Naperville; Peter G. Pappas, Downers Grove, and Walter C. Edmisten, Olympia Fields, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 522,471, Nov. 11, 1974, Pat. No. 3,915,668. This application June 17, 1975, Ser. No. 587,635

Int. Cl.² C08F *218/12*

U.S. Cl. 526—331 **4 Claims**

1. An oil-soluble terpolymer composition consisting of 45–80 wt. % ethylene, 10–25 wt. % vinyl ester of a fatty acid having up to about eight carbon atoms, and 10–30 wt. % of a dialkylvinyl carbinol wherein the alkyl groups have up to about six carbon atoms, said terpolymer having a number average molecular weight in the range of from about 500 to about 10,000.

4,015,064

MANUFACTURE OF POLYVINYL CHLORIDE OF LOW VINYL CHLORIDE MONOMER CONTENT

Martin L. Feldman, E. Brunswick, and Robert S. Miller, Bridgewater, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed June 24, 1974, Ser. No. 482,115

Int. Cl.² C08F *6/10*

U.S. Cl. 528—491 **8 Claims**

1. The process for the removal of vinyl chloride from a slurry or latex that contains from about 100 parts to 15,000 parts by weight of vinyl chloride per million parts by weight of said slurry or latex and from 5% to 50% by weight of a polymer selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride with at least one monomer copolymerizable therewith that comprises the steps of

a. adding to the slurry of latex from about 0.5% to 20% by weight, based on the weight of the surry or latex, of a compound selected from the group consisting of vinyl acetate, methylene chloride, di-tert.butyl-p-cresol, and mixtures thereof,

b. maintaining the slurry or latex at a temperature in the range of 25° C. to 125° C. at a vacuum in the range of about 28 mm. to 630 mm. Hg, and

c. removing the vinyl chloride vapor that is evolved until the slurry or latex contains less than 50 ppm. of vinyl chloride.

4,015,065

TREATMENT OF VINYL HALIDE POLYMERS

Anthony John Park, South Croydon, and Alan Charles Sturt, Guildford, both of England, assignors to The British Petroleum Company Limited, London, England

Filed May 5, 1975, Ser. No. 574,396

Claims priority, application United Kingdom, May 17, 1974, 22254/74

Int. Cl.² C08F *6/00, 6/16, 6/24, 6/28*

U.S. Cl. 528—503 **17 Claims**

1. A process for treating vinyl halide polymer containing residual vinyl halide produced by the polymerization of monomeric material consisting of vinyl halide and 0 to 30% by weight of total monomeric material of comonomers copolymerizable with vinyl halide which comprises subjecting said polymer to radio frequency dielectric heating in the presence of added free radical polymerization initiator.

4,015,066

CRYSTALLINE MONOSODIUM N⁶,2′-O-DIBUTYRYL-ADENOSINE-3′,5′-CYCLIC MONOPHOSPHATE AND PRODUCTION THEREOF

Takashi Nagata; Goro Motoki; Morio Suzuki, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Apr. 8, 1974, Ser. No. 459,203

Claims priority, application Japan, Apr. 6, 1973, 48-38756; Apr. 6, 1973, 48-38757

Int. Cl.² C07H *19/20*

U.S. Cl. 536—27 **9 Claims**

1. Crystalline N⁶,2′-O-dibutyryl-adenosine-3′,5′-cyclic monophosphate, monosodium salt, produced by the step of causing a crystallizing solvent selected from a group consisting of ethyl ether, tetrahydrofuran, dioxane acetone, diethyl ketone, methyl ethyl ketone, or an ester selected from C_1–C_4 alkyl acetates to contact an alcoholic solution, an aqueous alcoholic solution, wherein the alcohol is selected from the group consisting of methanol, ethanol, propanols, and butanols, or a simple aqueous solution of the N⁶,2′-O-dibutyryl-adenosine-3′,5′-cyclic monophosphate, monosodium salt, said crystallizing solvent being of such a nature that said N⁶,2′-O-dibutyryl-adenosine-3′,5′-cyclic monophosphate monosodium salt is insoluble in it but it is at least partly miscible with the solvent constituting said solution, said crystalline salt having the following lattice distance upon X-ray diffraction:

Angstrom	Note
1.994	weak
2.818	weak
6.303	slightly weak
7.865	weak
11.787	weak
17.327	very intense

4,015,067

METHOD OF PREPARING POLYSACCHARIDE ETHERS AND APPARATUS

Gordon Y. T. Liu, Baton Rouge, and Carl P. Strange, Walker, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1975, Ser. No. 605,794

Int. Cl.² C08B *11/00*

U.S. Cl. 536—96 **17 Claims**

1. A method of preparing an ether of a polysaccharide comprising

1. continuously preparing a slurry of a finely divided polysaccharide, an alkali metal hydroxide in an amount sufficient to provide from about 0.25 to about 1.7 parts by weight based on the polysaccharide, and an etherifying ingredient with or without an inert carrier fluid in the substantial absence of free oxygen,
2. feeding said slurry into a tubular reactor, free of obstructions to passage of the slurry, under a pressure of from about 100 to about 400 psig at a rate to provide a reaction period of from about 10 to about 60 minutes at a temperature of from about 30 to about 135° C.
3. removing the reacted slurry from the reactor and
4. purifying and recovering the ether of the polysaccharide.

4,015,068

GRAPHITIZATION FURNACE

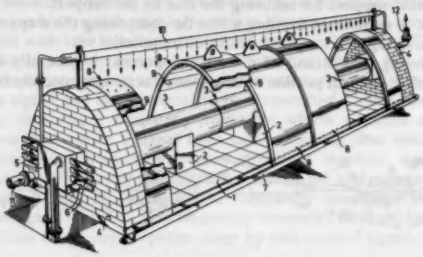
Otto Vohler, Nordendorf, Germany, assignor to Sigri Elektrographit GmbH, Augsburg, Germany

Filed Oct. 20, 1975, Ser. No. 624,274

Claims priority, application Germany, Dec. 7, 1974, 2457923

Int. Cl.² F27D *11/04*

U.S. Cl. 13—7 3 Claims



1. Furnace for the graphitization of carbon bodies by direct resistance heating which comprises two current conducting electrodes movable in the longitudinal furnace axis, carbon bodies in an arrangement of at least one row clamped between said electrodes with the end surface of each body in contact with an end surface of an adjacent body in the row, and each end surface of bodies at the end of a row contacting an electrode, carrier members disposed in the furnace floor for receiving the carbon bodies, said furnace gas-tightly enclosing said carbon bodies, said furnace having shell-shaped walls with movable segments and said furnace having layers consisting of isolation materials to protect said carbon bodies from attack by oxygen from the air, and said furnace having a space containing gases between the carbon bodies and the furnace walls.

4,015,069

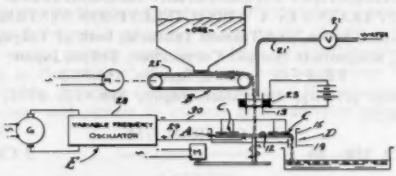
APPARATUS FOR EXTRACTING METALS FROM ORE

Robert G. Owen, 1980 Lake St., Huntington Beach, Calif. 92646

Division of Ser. No. 498,209, Aug. 16, 1974. This application Sept. 11, 1975, Ser. No. 612,268

Int. Cl.² H05B *7/00*

U.S. Cl. 13—9 R 20 Claims



1. Apparatus for reducing metallic values from granular ore, and including; an upwardly disposed planar electrode for the support of a layer of said granular ore, at least one electrode member with a face opposed to the first mentioned planar electrode and having a multiplicity of electrode points spaced uniformly from the first mentioned electrode to contact the granules of ore, and electrical power means applying potential to the electrodes for discharge of energy through the granules of ore to heat and fuse the said metallic values into the melted state which subsequently solidifies into stable metal form smaller than the ore granules to thereby shift the resistive conductivity from electrode point to electrode point, whereby random discharge of electrical energy is coextensive of said layer of ore with commensurate distribution of subjection of the same to fusion.

4,015,070

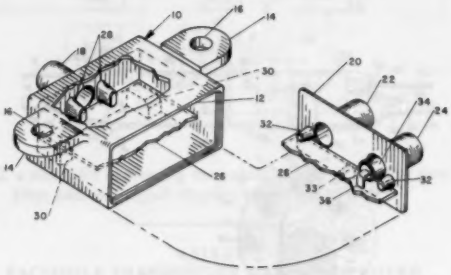
SIGNAL DISTRIBUTION ASSEMBLY AND METHOD FOR ASSEMBLING

Donald Leroy Theurer, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed June 23, 1975, Ser. No. 589,272

Int. Cl.² H05K *5/04*

U.S. Cl. 174—52 R 14 Claims



1. A CATV distribution assembly for splitting CATV signals supplied by a main cable into a plurality of CATV signals for output cables, comprising: an electrically conductive housing; a plurality of cable connectors formed as an integral portion of the housing; a plurality of projections located in predetermined positions on the interior of the housing; a circuit board fixedly held in the housing by the projections; and an electrical conductor fixed to the circuit board in a predetermined position so that the electrical conductor fits within a predetermined cable connector in position to mate with a cable when the cable is attached to the predetermined cable connector.

4,015,071

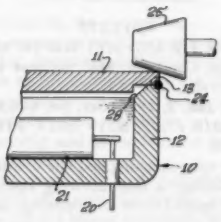
MICROELECTRONIC CIRCUIT CASE

Robert L. Peet, Yorba Linda, Calif., assignor to Bliss & Laughlin Ind., Inc., Anaheim, Calif.

Filed June 5, 1975, Ser. No. 584,105

Int. Cl.² H05K *5/06*

U.S. Cl. 174—52 S 2 Claims



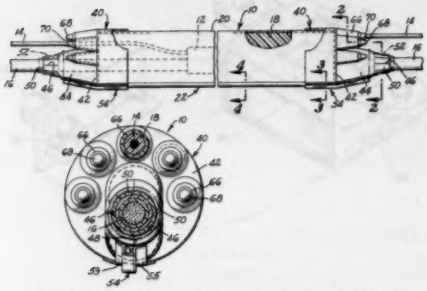
1. A microelectronic circuit case comprising a unitary metal container with an open top and upstanding sides having a smooth flat upper edge with a substantially square outer corner for continuous seam welding at the outer corner to a lid placed over the open top to form a hermetically sealed package, the improvement comprising a chamfer at the inner corner of said upper edge.

4,015,072

RE-ENTERABLE CABLE SPLICE ENCLOSURE AND KIT INCLUDING RE-CLOSABLE TUBULAR HOUSING AND END CAPS

George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Los Angeles, Calif., a part interest

Filed Sept. 18, 1975, Ser. No. 614,375
Int. Cl.² H02G 15/18
U.S. Cl. 174—92 7 Claims



1. A re-enterable cable splice enclosure kit including:
a. a longitudinally split tubular housing;
b. releasable housing locking means for releasably locking said tubular housing against circumferential expansion intermediate the ends thereof and for closing the longitudinal split in said housing intermediate the ends thereof;
c. flexible, longitudinally split end caps respectively telescopable over the ends of said tubular housing;
d. two releasable end cap locking means for respectively releasably locking said end caps against circumferential expansion and for closing the longitudinal splits therein;
e. at least one of said end caps including an outer end provided with a longitudinally extending nipple having circumferentially spaced slits extending longitudinally inwardly from the outer end thereof; and
f. at least one of said end caps including an outer end provided with at least one longitudinally extending nipple having a closed outer end adapted to be severed to open same.

4,015,073

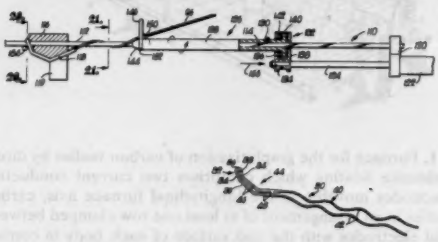
UNIVERSAL LINE TIE AND METHOD OF MAKING SAME

Gary R. Dickerson, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Jan. 2, 1976, Ser. No. 646,042
Int. Cl.² H01B 17/22; B21F 3/027; F16G 11/00
U.S. Cl. 174—148 23 Claims

1. A line tie for tying an elongated line to a support therefor, said support including a line-receiving opening and a line tie-engaging area spaced from said opening, said line tie comprising:
an elongated, unitary strand of substantially shape-retaining, yieldable material configured to present a generally U-shaped bight portion having spaced arms for receiving said line adjacent one side of said support, with an elongated leg portion extending from each of said arms,
each of said leg portions being configured to present a line-gripping section spaced from a corresponding arm which includes a series of generally helical convolutions which are dimensioned for wrapping about and gripping said line at a point adjacent the side of said support opposite said one side thereof,
each of said leg portions also including an intermediate section between each of said arms and a corresponding line-gripping section and having at least a pair of interconnected, generally straight segments disposed at an angle relative to each other,
said intermediate sections each being of length and configuration for yieldably engaging the line tie-engaging area of said support for securing the line to the support.

20. A method of forming a line tie comprising the steps of:
providing an elongated strand of material;
forming said strand of material to present a generally U-shaped bight portion having spaced arms intermediate the ends of said strand, and an elongated leg portion extending from each arm with the respective leg portions extending in the same general direction from said bight portion;



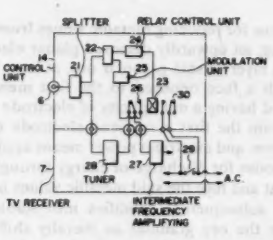
positioning said strand of material adjacent an elongated forming rod with said leg portions extending generally along the length of the latter;
positioning strand-engaging means in engagement with at least one of said leg portions; and
causing relative, generally helical shifting movement between said rod and strand-engaging means for causing the latter to slidingly engage said leg portion and form at least a part of both of said leg portions about said rod in a generally helical manner.

4,015,074

VOLUNTARY INFORMATION TRANSMITTING APPARATUS IN A WIRED TELEVISION SYSTEM

Yoshikatsu Inoue, and Takeshi Takeuchi, both of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Feb. 9, 1976, Ser. No. 656,692
Claims priority, application Japan, Feb. 13, 1975, 50-20144[U]
Int. Cl.² H04N 7/18
U.S. Cl. 358—86 3 Claims



1. In a wired television system wherein television broadcast signals received by a community antenna are transmitted through a splitter to television receivers of receiving subscrib-

ers, voluntary information transmitting apparatus in a wired television system comprising an information signal generator which transmits a guide information signal at an ordinary time and an alarm information signal in an emergency, a modulator which modulates the signal from said information signals generator into a frequency band of the television broadcast signal, a control signal generator which provides in the emergency a control signal for causing the television receiver on the subscriber side to pick out said alarm information signal, a mixer which mixes said information signal and said control signal with said television broadcast signal, a branching filter which separately transmits said information signal and said control signal among said television broadcast signal, information signal and conrol signal to be transmitted to said television receiver, a frequency converter which converts said alarm information a signal from said branching filter into an intermediate frequency of said television receiver, and a change-over switch disconnects a tuner of said television receiver and an intermediate frequency amplifier stage thereof and connects said frequency converter and said intermediate frequency amplifier stage by said control signal.

4,015,075

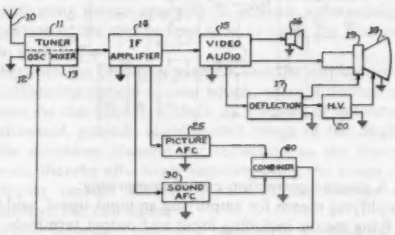
TELEVISION RECEIVER AUTOMATIC FREQUENCY CONTROL SYSTEM

John Y. Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 619,084

Int. Cl.² H04N *5/60*

U.S. Cl. 358—158 **9 Claims**



3. A wide range AFC circuit including separate picture and sound detection means, for use in a television receiver, exhibiting an amplitude versus frequency response characteristic having two portions and producing a first polarity correction voltage for signal frequencies falling in one of said portions and a second polarity correction voltage for signal frequencies falling in the other of said portions; said wide range being bounded by detection slopes at the nominal IF frequencies of the sound and picture IF carriers of a translated television signal.

4,015,076

NOISE ELIMINATING CIRCUIT FOR VIDEO TELEVISION SIGNAL

Makoto Ishiodori, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,822

Claims priority, application Japan, June 17, 1964, 39-70464[U]

Int. Cl.² H04N *5/21*

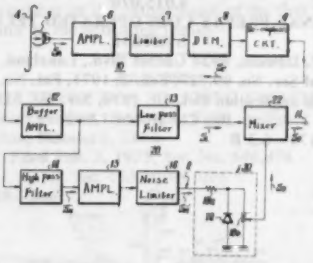
U.S. Cl. 358—167 **8 Claims**

1. A noise eliminating circuit for video television signals having synchronous denoting signals comprising:

a. a low pass filter through which a substantially low frequency band component of said video television signals is passed;

b. a high pass filter through which a substantially high frequency band component of said video television signals is passed;

c. a signal clipping circuit connected to said high pass filter by which black peak signals over a predetermined black signal level are clipped from said high frequency band component; and



d. a mixer for combining the output signals of said low pass filter and said signal clipping circuit.

4,015,077

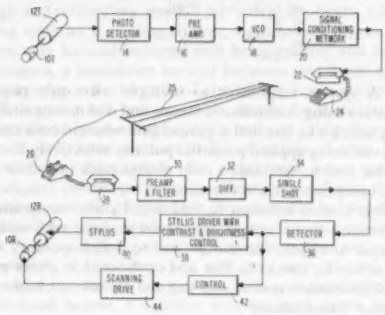
FACSIMILE TRANSMITTER HAVING IMPROVED RESPONSE

Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 21, 1975, Ser. No. 606,507

Int. Cl.² H04N *1/02*

U.S. Cl. 358—280 **18 Claims**



1. A facsimile transmitter for use in producing a copy at one location which is a facsimile of a document at another location comprising:

means for illuminating the document;

photodetector means in optical communication with the document for detecting dark-light variations between dark regions and light regions in the illuminated document, said photodetector means generating a signal representing said dark-light variations;

means for scanning said photodetector means relative to said document;

amplifier means coupled to said photodetector means for amplifying said photodetector signals; and

automatic gain control means associated with said amplifier means including electronically controlled means responsive to the output of said amplifier means for increasing the gain of said amplifier in response to a lesser amount of light detected by said photodetector means when detecting dark regions, said gain control means also including adjustable means which may be set so as to limit the increase in gain by said electronically controlled means when detecting dark regions for extended duration thereby assuring a substantial and continuing difference between transmission signals representing light regions on

said document and transmission signals representing dark regions on said document.

4,015,078

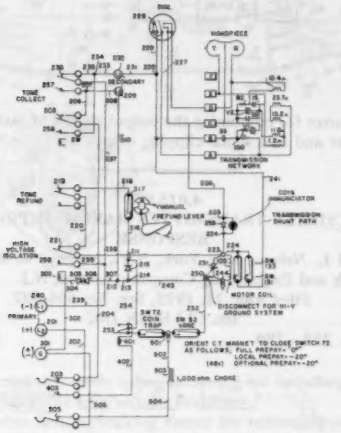
OPTIONAL PREPAY COIN OPERATED TELEPHONE SYSTEM

Charles E. Dawson, 4924 Gachet Blvd., Lakeland, Fla. 33803

Division of Ser. No. 99,727, Feb. 2, 1971, Pat. No. 3,842,210. This application Oct. 10, 1974, Ser. No. 513,766

Int. Cl.² H04M 17/02

U.S. Cl. 179—6.3 R **28 Claims**



1. A system responsive to multiple wire coin paystation operation using transmission means and dial means and having an L_1 line, an L_2 line and a ground line wherein coin control is achieved using applied potential polarity selectively to operate a motor coil to establish a coin collect path or a coin refund path, comprising in combination,

a first circuit between L_1 line and L_2 line comprising first unidirectional means connected in shunt with said motor coil to bypass the motor coil to a first polarity voltage across L_1 line to L_2 line and connected in series with the transmission means and the dial means to enable dialing and transmission;

a second circuit between L_1 line and L_2 line for applying a second polarity opposite to said first polarity across said motor coil to energize the same and establish said collect path;

a shunt third circuit comprising a motor coil switch means in a shunt connection from the motor coil to L_1 line by bypassing said transmission means and dial means wherein the motor coil switch means are closed in response to energization of said motor coil;

a fourth circuit comprising a normally open unidirectional switch means connected in shunt with said motor coil and oriented oppositely to said first unidirectional means;

fifth circuit means for closing said second switch means in response to coin passage along the collect path to bypass the motor coil and remove the shunt connection across the transmission means and the dial means to establish transmission;

a sixth series circuit comprising voltage discriminator means, relay coil means, said first unidirectional means, switch contacts, said transmission means and dial means between L_1 line and ground for carrying current when voltage applied thereto exceeds the voltage discriminated by said discriminator means; and

a seventh circuit established by said last-mentioned current by energizing the relay coil means to actuate said switch contacts to connect the motor coil in series with the relay coil and discriminator means between L_1 line and ground to provide for coin refund or collect depending upon the polarity of any discriminated voltage between L_1 line and ground.

4,015,079

GAMMA CORRECTION CIRCUIT

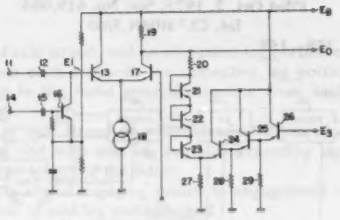
Itsuzou Satou, and Kikuo Saitou, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 476,794, June 6, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 675,144

Claims priority, application Japan, June 12, 1973, 48-66217

Int. Cl.² H04N 5/20

U.S. Cl. 358—164 **4 Claims**



1. A gamma correction circuit comprising:

amplifying means for amplifying an input signal, said amplifying means including input and output terminals;

a non-linear circuit having a first terminal and a second terminal and a plurality of series-connected diode means connected between said first terminal and said second terminal, the first terminal of said non-linear circuit being coupled to the output terminal of said amplifying means and each of said diode means being connected to have the same polarity so that current flows from the first terminal to the second terminal of said non-linear circuit, wherein the voltage of a signal appearing at the first terminal of said non-linear circuit is varied non-linearly in accordance with the change in the voltage of an input signal to said amplifying means;

an emitter follower circuit having an input terminal and an output terminal and a plurality of cascaded emitter follower transistors connected between said input and output terminals of said emitter follower circuit, the output terminal of said emitter follower circuit being coupled to the second terminal of said non-linear circuit, each of said emitter follower transistors being connected so that current flows from the input terminal of the emitter follower circuit to the output terminal of the emitter follower circuit, said plurality of cascaded emitter follower transistors being equal in number to said plurality of diode means; and

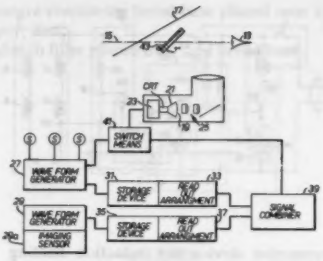
circuit means for applying a control signal coupled to the input terminal of said emitter follower circuit, for varying nonlinearity of said input signal;

whereby a change due to ambient temperature in a voltage across said non-linear circuit is compensated by a change due to ambient temperature in a voltage across said emitter follower circuit.

4,015,080
DISPLAY DEVICES

Leslie Donald Moore-Searson, Tunbridge Wells, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Continuation-in-part of Ser. No. 465,146, April 29, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,731
Claims priority, application United Kingdom, Apr. 30, 1973, 20400/73
Int. Cl.² H04N 7/18
U.S. Cl. 358—104 **4 Claims**



1. A head-up display system for a vehicle comprising:

a. a semi-reflective image combiner element adapted to be installed in the vehicle on the line of sight of an observer in the vehicle of a scene outside the vehicle;

b. a display surface;

c. activating means operable to activate substantially any portion of the said surface so as to cause the said portion to emit light;

d. between the combiner element and the display surface a collimating optical system which, when a display is present on the display surface as a result of activation as aforesaid, projects a collimated image of the display to the combiner element for reflection to the observer's eyes, thereby effectively superimposing the image of the display on the observer's view of the outside scene through the combiner;

e. a first waveform generator responsive to input data signals derived from sensors carried by the vehicle and representing the relationship of the vehicle to its environment so as to repetitively develop a time sequence of output signals capable of being employed for controlling the activating means to activate desired line segments of the display surface thereby to present at said surface symbols representative of the aforesaid relationship;

f. a second waveform generator operable in response to signals derived from an imaging sensor carried by the vehicle to develop a raster scan output signal representative of the vehicle environment as sensed by the imaging sensor during the scan;

g. a symbol storage device operable in response to output signals from the first waveform generator so as to store symbols to be presented at the display surface;

h. a symbol read-out arrangement operable to develop a raster scan output signal representative of the symbols stored in the symbol storage arrangement, said output signal having a higher scan rate than the output signal of said second waveform generator;

i. an image storage device operable in response to the output signal of the second waveform generator so as to store a representation of the environment sensed by the imaging sensor;

j. an image read-out arrangement operable to develop a raster scan output signal representative of the representation of the environment stored in the image storage device, the image read-out arrangement output signal having the same format as the symbol read-out arrangement output signal;

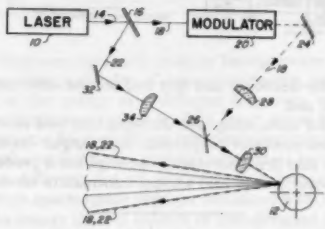
k. signal combiner circuitry operable to receive the output signals from both read-out arrangements so as to develop a raster scan output signal representative of both said symbols and said environment; and

l. means for connecting either the output of the signal combiner circuitry or the output signal of the first waveform generator to the activating means.

4,015,081
MULTIFUNCTION SCANNING SYSTEM

Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,476
Int. Cl.² H04N 3/08
U.S. Cl. 358—206 **10 Claims**



1. In a flying spot scanning system: an illumination source generating a collimated beam, a beam splitter in the path of said beam permitting a portion of said beam to pass therethrough and redirecting another portion of the beam, a pair of imaging stations, a reading station, a rotatable polygon scanner optically located between said beam splitter and each of said stations, a modulator located between said beam splitter and said polygon in the path of one of said beam portions for modulating said one beam portion, means for directing each portion of said beam along separate paths to said polygon, the width of each beam portion in the direction of scan at the polygon being substantially the same, said beam portions being aligned on said polygon in a direction parallel to the axis of rotation, said directing means directing said beam portions to said polygon along such paths that said beam portions will reflect from said polygon along separate paths, an imaging lens optically located between said polygon and said beam splitter and located in the path of both said modulated and unmodulated beams, a cylinder lens for each beam located between said beam splitter and said imaging lens, said cylinder lenses each having its power plane in a plane generally perpendicular to the axis of rotation of said polygon, said reading station being in the path of the unmodulated beam, a beam splitter optically located between said imaging stations and in the path of said modulated beam reflected from said polygon, said last named beam splitter directing a portion of said modulated beam to one of said imaging stations and allowing another portion of said modulated beam to pass to the other of said imaging stations.

4,015,082
MULTI-CHANNEL SIGNAL DECODER

Thomas C. Matty, North Huntingdon, and Arun P. Sahasrabudhe, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

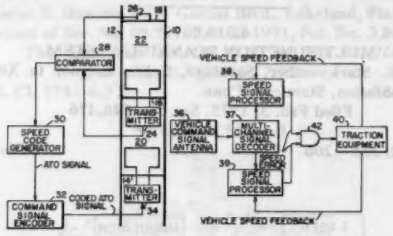
Filed Mar. 13, 1975, Ser. No. 558,108
Int. Cl.² H04L 27/14
U.S. Cl. 178—66 R **17 Claims**

1. In apparatus for providing an output control signal by decoding control information messages from a message signal containing multiple message frequencies, the apparatus comprising:

means for filtering first and second message frequencies from said message signal;

means for detecting first and second information messages from the respective first and second message frequencies, with one filtering means being operative with one detecting means in relation to each of said first and second message frequencies;

means for storing said first and second information messages;



means for decoding said first and second information messages; and

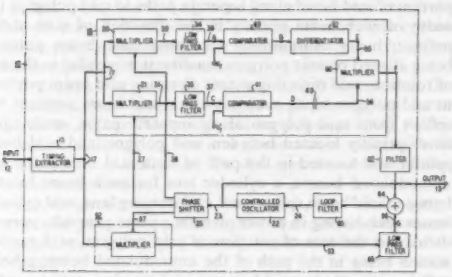
means for comparing said decoded first and second information messages to provide said output control signal when said first information message has a predetermined relationship with said second information message.

4,015,083

TIMING RECOVERY CIRCUIT FOR DIGITAL DATA

Jules Angelo Bellisio, Wall Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,331
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.1 **16 Claims**



1. A timing recovery circuit comprising

means for receiving a timing component,

means for generating a signal having a frequency varying in response to a control signal,

means responsive to a difference between phase of the variable frequency signal and phase of the timing component for producing a control component,

means responsive to cycle slips between the variable frequency signal and the timing component for producing a series of pulses having a polarity related to the sense of the cycle slips and having a repetition rate directly related to the rate of the cycle slips except when amplitude of the timing component falls below a predetermined value whereupon no pulses are produced, and

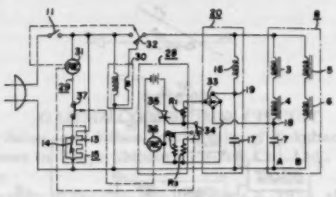
means for combining the control component with the series of pulses into the control signal that adjusts the frequency of the signal from the generating means into synchronization with the timing component.

4,015,084

PROTECTIVE DEVICE FOR INDUCTION HEATING APPARATUS

Akihiro Tsumori, Shizuoka, and Kenji Shima, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,154
Claims priority, application Japan, July 15, 1974, 49-83619; Mar. 6, 1975, 50-27667
Int. Cl.² H05B 5/04
U.S. Cl. 219—10.49 **2 Claims**



1. A protective device for induction heating apparatus comprising:

a specific heating element for holding a substance to be cooked,

an excitor for induction heating the specific heating element,

means for applying an operating voltage to the excitor,

a power switch for turning on the excitor,

means for delaying the application of the operating voltage to the excitor for a predetermined time after the turning on of the power switch,

means for detecting immediately after the turning on of the power switch and thereafter the presence of a heating element other than the specific heating element, the absence of the specific heating element of any other heating element or an undesirably high temperature of the specific heating element,

means for preventing the application of operating voltage to the excitor in response to detection of the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element,

the detecting device comprising a first series circuit of a detector winding wound on a detector core for forming a magnetic flux circuit with the heating element to impart a weak attractive force and a capacitor connected to the detector winding and a second series circuit of a mimic winding and a capacitor which is connected in parallel to the first series circuit to pass current having substantially the same phase as that of the current passing through the first series circuit during normal operation, and means for preventing the passage of current to the excitation windings of the excitor for the predetermined time for detecting the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element.

4,015,085

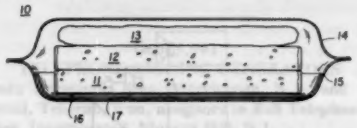
CONTAINER FOR THE MICROWAVE HEATING OF FROZEN SANDWICHES

Francis J. Woods, Fort Worth, Tex., assignor to Larry Lakey, Dallas, Tex., a part interest

Filed Apr. 30, 1975, Ser. No. 573,036
Int. Cl.² H02B 9/06
U.S. Cl. 219—10.55 E **15 Claims**

1. In a system for heating a frozen sandwich including a nonmetallic film enclosing said sandwich, the combination which comprises:

a. a conductive metallic layer placed over the inner bottom surface of said film and adapted for partial deflection of microwave energy applied to said film;



b. a moisture containing bread base placed over said metallic layer; and

c. a sandwich filler placed over said bread base.

4,015,086

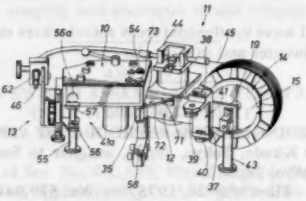
HINGED WELDING MACHINE

Russell S. Thatcher, 813 Sidnor, Alvin, Tex. 77511

Filed Apr. 9, 1975, Ser. No. 566,252

Int. Cl.² B23K *9/02*

U.S. Cl. 219—60 A **11 Claims**



1. A welding machine assembly for joining the abutting ends of substantially vertically extending workpieces in end-to-end relation, comprising:

a central panel assembly including means for supporting a welding torch proximate a work area;

a wire feed module assembly hingedly connected to and adjacent said central panel assembly, said wire feed module assembly being adapted to support a wire spool and reel having welding wire stored thereon;

a first roller assembly affixed to said wire feed module assembly for engaging a track mounted proximate a substantially vertically extending workpiece or pipe section and adjacent the work area;

a second roller assembly affixed to said central panel assembly for engaging said track, said first and second roller assemblies being oppositely disposed from one another with respect to the hinge point between said central panel assembly and said wire feed module assembly, said roller assemblies engaging said track to maintain the electrode of said welding torch in proper relation to the work area;

drive means including a driven sprocket gear carried by said welding machine for engaging a roller chain attached to said track for driving said welding machine assembly at a controllable rate along said track extending along said workpiece adjacent the work area;

control means for selectively engaging said sprocket gear with said roller chain to control movement of said welding machine assembly relative to said track; and

radius adjustment means connected between said central panel assembly and said wire feed module assembly for adjusting the effective radius of said welding machine assembly to correspond with the radius of said track.

4,015,087

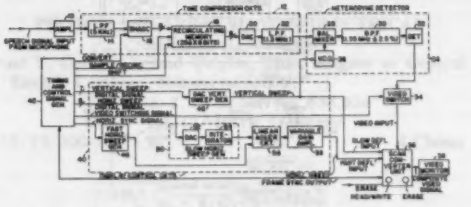
SPECTROGRAPH APPARATUS FOR ANALYZING AND DISPLAYING SPEECH SIGNALS

Leslie C. Stewart, Rochester, N.Y., assignor to Center for Communications Research, Inc., Rochester, N.Y.

Filed Nov. 18, 1975, Ser. No. 633,142

Int. Cl.² G10L *1/14*

U.S. Cl. 179—1 SP **16 Claims**



1. In a frequency spectrum analyzer having means for repetitively providing a plurality of successive signals, each corresponding to the energy in a different frequency range of a successive frequency spectrum of an input signal to be analyzed, apparatus for providing a real time spectrogram of said input signal consisting of a plurality of interval spectrograms each for a different one of said successive frequency spectrums, which spectrogram displays variations with respect to time in the energy thereof in each of said different frequency ranges, said apparatus comprising:

means for generating a plurality of display control signals which are repetitive, the first of said plurality of control signals being repetitive at a rate corresponding to the repetition rate of said successive signals, the second of said plurality of control signals being repetitive at a rate corresponding to the repetition rate of said plurality of successive signals and having a period equal to the period of each of said interval spectrograms of a submultiple thereof, the third of said plurality of control signals being repetitive at a rate of a plurality of said successive spectrums, and

means operated by said control signals for visibly displaying said successive signals along a raster which is defined in one direction by said first and third control signals and in a second direction, transverse to said first direction, by said second control signals whereby to produce a plurality of concatenated interval spectrograms which display the spectrogram of the input signal in real time.

4,015,088

REAL-TIME SPEECH ANALYZER

John Joseph Dubnowski, Hampton; Lawrence Richard Rabiner, Berkeley Heights, both of N.J.; Ronald William Schafer, Atlanta, Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1975, Ser. No. 627,865

Int. Cl.² G10L *1/04*

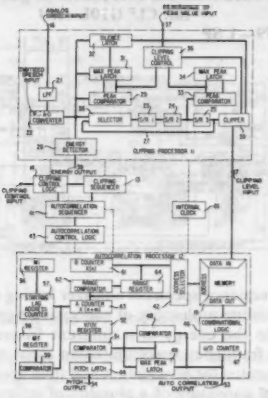
U.S. Cl. 179—1 SC **35 Claims**

1. A speech analyzer for continuously determining the pitch period of an applied speech signal comprising:

means for dividing said speech signal into a succession of intervals, each of said intervals including a predetermined number of digitally encoded speech samples;

clipping means responsive to an applied clipping level signal for clipping n consecutive intervals of said applied speech signal, said clipping means supplying a first predetermined signal for positive speech samples of a magnitude which exceeds said applied clipping level signal, said clipping means supplying a second predetermined signal for negative speech samples of a magnitude which exceeds said applied clipping level signal, said clipping means supplying a third predetermined signal for speech samples of magnitude less than said applied clipping level signal;

means for adjusting said clipping level signal in response to the peak signal samples within preselected ones of said n consecutive intervals of applied speech; autocorrelation means responsive to said first, second and third predetermined signals supplied by said clipping means for determining the value of the autocorrelation function of said n consecutive speech intervals at a plurality of predetermined lag elements; and



means responsive to the peak value of said autocorrelation function for supplying a signal indicative of said pitch period.

4,015,089

LINEAR PHASE RESPONSE MULTI-WAY SPEAKER SYSTEM

Shinichiro Ishii, Neyagawa; Kanji Kakao, Katano; Takafumi Ueno, Kadoma, and Jun Kimura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1976, Ser. No. 658,758

Claims priority, application Japan, Mar. 3, 1975, 50-26239

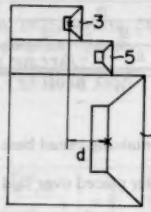
Int. Cl.² H04R *1/02, 3/14*

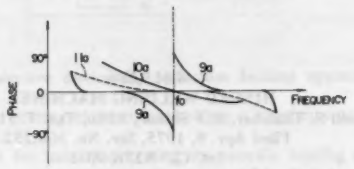
U.S. Cl. 179—1 E **8 Claims**

1. A multi-way speaker system comprising a low pass filter, a high pass filter each having a predetermined slope in the stop band and a band pass filter having a single resonance characteristic each for dividing an input audio signal to predetermined frequency bands, and a woofer, a tweeter and a squawker each connected to an output terminal of said low pass filter, said high pass filter and said band pass filter respectively,

said tweeter being stepped back from said woofer such that when said woofer and said tweeter are driven by outputs of said low pass filter and said high pass filter the phases of sound waves radiated from said woofer and said tweeter are reverse at a listening area in front of said woofer, said tweeter and said squawker at the center frequency in the overlap region of the sound pressure-frequency characteristics for said woofer and said tweeter,

said squawker being arranged such that when said squawker is driven by an output from said band pass filter a phase-frequency characteristic of sound wave radiated from said squawker, at said listening area, is laid substantially at the center of a phase-frequency characteristic of the sound wave synthesized from sound waves radiated from said tweeter and said woofer.





4,015,090

RECORDING AND/OR REPRODUCING APPARATUS

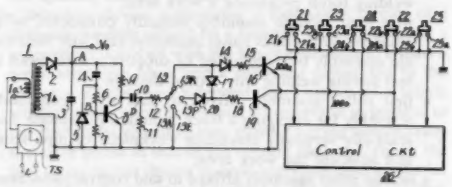
Takaharu Kitada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,044

Claims priority, application Japan, May 28, 1974, 49-59911

Int. Cl.² H04N *1/64;* **G11B** *5/008, 15/02*

U.S. Cl. 179—6 R **12 Claims**



1. A recording and/or reproducing apparatus having a plurality of modes of operation, comprising main operating mode selecting means which are selectively actuable for producing operation-initiating trigger pulses respectively corresponding to said modes of operation, a self-holding operation-controlling circuit comprising signal-responsive means actuable by said operation-initiating trigger pulses for establishing and maintaining respective conditions corresponding to selected modes of operation, auxiliary trigger signal generating means operative in response to applying of electric power thereto for producing an auxiliary trigger signal, auxiliary operating mode-selecting means selectively disposable and maintainable in an inoperative position and in at least one operative position corresponding to a respective one of said modes of operation of the apparatus, and triggering means responsive to said auxiliary trigger signal in said operative position of the auxiliary mode-selecting means for applying a respective automatic

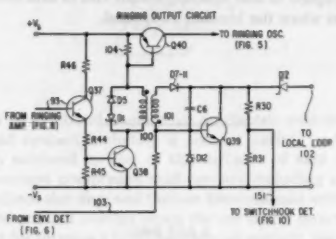
operation-initiating trigger signal to said signal-responsive means for causing the latter to automatically assume the condition thereof corresponding to the mode of operation selected by said auxiliary mode-selecting means.

4,015,091

TELEPHONE RINGING GENERATORS

Tadikonda Narasimha Rao, Morristown, N.J., and Rouben Toumani, Teheran, Iran, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 5, 1975, Ser. No. 638,151
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 R **11 Claims**


RINGING OUTPUT CIRCUIT
TO RINGING OSC. (FIG. 5)
FROM RINGING AMP (FIG. 8)
TO LOCAL LOOP 102
FROM ENV. DET. (FIG. 6)
TO SWITCHHOOK DET. (FIG. 10)

11. An excitation source for telephone ringers comprising

a direct current voltage level converter,

switching means for disabling said converter at a ringing signal rate, and

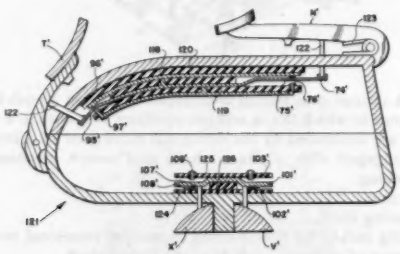
means for coupling said converter to said telephone ringer.

4,015,092

MULTIPLE SWITCH ASSEMBLY FOR ELECTRICALLY OPERATED INSTRUMENT

Yoshiro Suzuki, No. 7-15, 1 chome, Shirakawa Koto-ku, Tokyo, Japan

Division of Ser. No. 472,688, May 23, 1974, Pat. No. 3,897,708. This application Apr. 25, 1975, Ser. No. 571,626
Claims priority, application Japan, May 24, 1973, 48-58469
Int. Cl.² H01H *1/34, 5/18;* G10D *7/06*
U.S. Cl. 200—5 R **1 Claim**



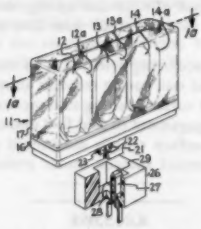
1. In combination with keys on an electrical musical instrument, the keys of which are oriented on a casing of the instrument to correspond to the orientation of keys on a woodwind or like instrument, a composite switch structure for providing a plurality of independently actuable switches and comprising at least three superposed, aligned panels at least two of which are provided with a plurality of paired contacts fixed approximate at least one of the corresponding edge thereof in facing and aligned spaced apart relation, the third panel being interposed between said two panels and carrying resilient movable contact arms each of said arms being associated with a pair of fixed contacts and conductive means extending through the respective panels for connecting individual ones of said contacts to a utilization device, said movable contact having a normal position determined by the natural resilience of the arms, and being displaceable from said normal position by said keys upon operation thereof, said movable arms engaging one of the fixed contacts in its associated pair in the said normal position thereof and engaging the other of said fixed contacts in its associated pair in an other position thereof upon actuation of selected ones of said keys.

4,015,093

PHOTOFLASH ARRAY HAVING ELECTRICAL SHORTING MEANS

Paul T. Coté, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,036
Int. Cl.² H01R *33/30*
U.S. Cl. 200—51.1 **4 Claims**



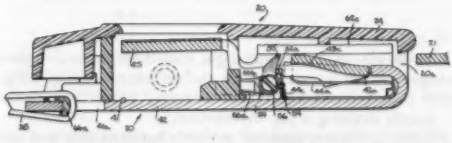
1. A flash lamp array having a set of electrical connector terminals adapted to be connected to a socket, said terminals comprising substantially rigid blades in mutually parallel spaced apart relationship, at least one of said blades being provided with an integral tab struck out of the blade and shaped to normally touch another of said blades, said socket being provided with a rib which forces said tab away from its said normal contact with a terminal blade.

4,015,094

SAFETY SEAT BELT BUCKLE SWITCH WITH COIL SPRING CONTACT

James A. Gavagan, Center Line, and Carl Mogens Petersen, III, Pontiac, both of Mich., assignors to Irvin Industries, Inc., Greenwich, Conn.

Division of Ser. No. 439,732, Feb. 5, 1974, abandoned. This application Sept. 12, 1975, Ser. No. 612,856
Int. Cl.² H01H *3/20*
U.S. Cl. 200—61.58 B **2 Claims**



1. A safety seat belt buckle comprising:

a buckle housing having a base and first and second opposed side walls,

a clip-holding latching lever having a push button releasing portion, said lever mounted for limited movement within said housing, said lever having a clip holding latch portion and an opening rearward of said latch portion,

a spring mounted between said lever and said base of said housing, said lever when depressed compressing said spring, said lever being held in a normal upward position by said spring,

the forward portion of said housing having guide means to receive a mating clip,

a switch housing mounted in said buckle housing rearward of said latch portion of said latching lever,

a transverse shaft mounted for rotation on said switch housing,

a finger extending radially outward from said shaft,

a coil spring mounted on said shaft to bias said shaft to a position, in a normal unbuckled state, in which said finger extends upward through said lever opening, said finger being pushed backward when an associated clip is inserted through said guide means causing rotation of said shaft prior to latching engagement between said clip and said latch portion,

first and second electrical contacts incorporating respectively first and second ends of said coil spring, rotation of said shaft through backward movement of said finger changing the state of said first electrical contact,

said first electrical contact comprising a stationary portion having a contact surface and a movable portion constituting said first end of said coil spring, movement of said shaft causing movement of said first end of said coil spring,

said contact surface being oriented such that the axis of said first end of said coil spring remains substantially parallel to said contact surface during said movement of said first end so that engagement of said first end of said spring and said contact surface entails movement of said first end across said contact surface under pressure of said coil spring.

4,015,095

CONTACT ARRANGEMENT FOR AN ELECTRIC COMPRESSED-GAS CIRCUIT BREAKER

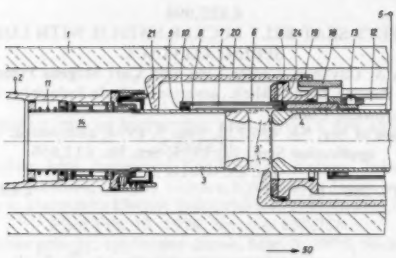
Rainer Bitsch; Heiner Marin, and Helmut Beier, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 4, 1975, Ser. No. 610,230

Claims priority, application Germany, Sept. 17, 1974, 2444943

Int. Cl.² H01H *33/42*

U.S. Cl. 200—148 A **9 Claims**



1. In an electric compressed-gas circuit breaker, a contact arrangement for interrupting an electric current comprising:

first base contact means and a second base contact conjointly defining a gap therebetween;

a bridging contact member movable between first and second positions for electrically joining said first base contact means and said second base contact in said first position and for moving in a direction toward said second base contact and running-off of said first base contact means to said second position thereby electrically separating said first base contact means from said second base contact, said first and second positions corresponding to the closed and open positions of the breaker, respectively;

said first base contact means including: a contact structure, a spring arranged at said contact structure and a first base contact movably mounted on said structure so as to be movable in said direction toward said second base contact against the force of said spring; and,

an electrodynamic control device including: first coil means for developing a force dependent upon the current to be interrupted for urging said first base contact toward said second base contact against the force of said spring when said breaker is opened;

second coil means for developing a repelling force in response to the current to be interrupted, said repelling force coacting with said spring for decelerating said first base contact in its movement toward said second base contact and for accelerating the same away from said second base contact shortly before zero crossover of said current whereby the spacing of said gap is adjusted for quenching the arc drawn when said bridging contact member separates from said first base contact; and,

commutation means for commutating the current to be interrupted to said first coil means and to said second coil means when the breaker is opened.

4,015,096

CHANGE-OVER SWITCH MECHANISM FOR PUSH-BUTTON TUNER

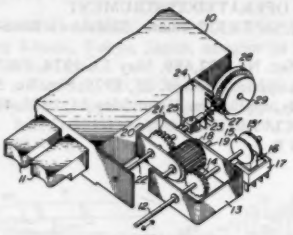
Kazumasa Fujita, Iwaki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1975, Ser. No. 608,863

Claims priority, application Japan, Aug. 31, 1974, 49-104619[U]

Int. Cl.² H01H *19/18*

U.S. Cl. 200—156 **8 Claims**



1. A change-over switch mechanism for use in a push-button tuner in which the in and out positions of a core in a coil tuner are controlled by the rotational movement of a crown gear engaged with a pinion shaft, said switch mechanism comprising;

a frame,

a tuning shaft,

tuning means for transmitting all manual rotational movement of said tuning shaft to the pinion shaft,

said tuning shaft being rotatably and axially slidably mounted on said frame and extending through said frame for direct manual rotational and axial control thereof, and

a switch means mounted for actuation by the sliding axial movement of said tuning shaft, said rotational movement of said tuning shaft being transmitted to the pinion shaft regardless of the axial position of said tuning shaft,

said tuning means including a toothed wheel means rigidly attached to said tuning shaft for transmitting the rotation movement of said tuning shaft to a gear mounted at a fixed axial position with respect to said frame, said gear and toothed wheel means being dimensioned such that said gear and toothed wheel means are in engagement regardless of the axial position of said tuning shaft.

4,015,097

ELECTRICAL CONTACT CONSTRUCTION

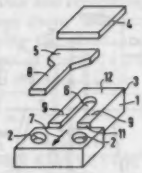
Manfred Schmeisser, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 21, 1975, Ser. No. 579,545

Claims priority, application Germany, May 27, 1974, 2425490

Int. Cl.² H01H 1/06

U.S. Cl. 200—275 5 Claims



1. In an electrical contact for an electric switching apparatus, said contact including a contact carrier and a contact overlay soldered to one of the surfaces of said carrier, the improvement comprising said contact including at least one longitudinal slot disposed therein between said contact carrier and said contact overlay along the arc travel direction of said contact for forming a blind hole in said contact, said blind hole being open at the end thereof along said arc travel direction and forming a canal between said contact carrier and said contact overlay within said contact which is open at one end thereof.

4,015,098

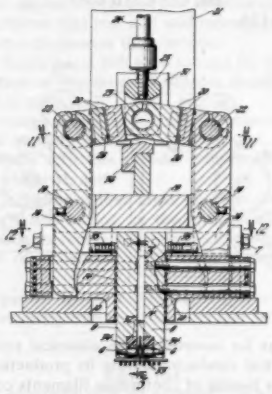
APPARATUS FOR MAKING INTERCELL CONNECTORS BY AN EXTRUSION-FUSION TECHNIQUE

Robert C. Matter, Anderson, and Larry D. Spangler, Yorktown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 418,590, Nov. 23, 1970, Pat. No. 3,947,290. This application Nov. 12, 1975, Ser. No. 630,958

Int. Cl.² B23K 11/10

U.S. Cl. 219—90 2 Claims



1. A welding gun for working in the narrow confines of adjacent cells of a lead-acid storage battery and for therein extruding lead alloy from plate strap lugs into an aperture in a partition separating said adjacent cells and then melting said alloy to completely fill said aperture with the alloy, said gun comprising:

a pair of opposing substantially cylindrical plunger-electrodes adapted to move toward each other to extrude alloy from said lugs into said aperture and thereafter supply electrical current to said extruded alloy to soften and melt it in the aperture;

a compressible lug-clamping means surrounding each of said plunger-electrodes and adapted to engage said lugs and hold them against said partition during said extrusion and melting;

a pair of opposed plunger-electrode holders each carrying one each of said plunger-electrodes and clamps and adapted to non-interferingly extend into said adjacent cells and therein coact with each other in a pincer-like motion to cause clamping of said lugs tightly against the partition surrounding the aperture, extruding of alloy from said lugs into the aperture until contact therebetween is made therein and welding the contacting extrusions to form an intercell connector through said aperture; and

means for forcefully driving said holders together, said driving means including a compressible means for storing rapidly-expendable potential energy behind said plunger-electrodes for immediate release to said plunger-electrodes as said electrical current is supplied.

4,015,099

METHOD OF JOINING A COPPER CONTACT BUTTON TO THE ALUMINUM HEADBAR OF AN ELECTRODE PLATE

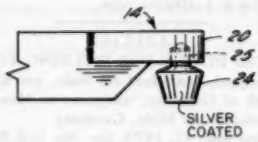
William Seniuk, and Régis Gagnon, both of Valleyfield, Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Feb. 21, 1975, Ser. No. 551,995

Claims priority, application Canada, Apr. 29, 1974, 198378

Int. Cl.² B23K 9/00

U.S. Cl. 219—118 3 Claims



1. A method of joining a copper contact button to the aluminum or aluminum alloy headbar of an electrode plate, comprising the steps of:

a. coating the copper contact button with a thin layer of silver;

b. mechanically threading the copper contact button into the aluminum or aluminum alloy headbar;

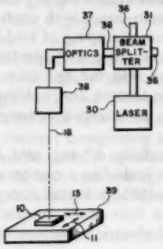
c. preheating the assembled silver coated copper button and aluminum or aluminum alloy headbar to a temperature ranging from 375° to 475° F for the purpose of achieving rapid fusion of copper and aluminum, and for preventing overheating of aluminum and diffusion of oxygen from the copper button into the weld; and

d. welding the coated copper contact button to the preheated aluminum or aluminum alloy headbar, after said preheating, and by an arc welding technique using an aluminum alloy filler rod and a shield of inert gas, whereby the strong mechanical joint provided by the threaded connection is reinforced by a strong metallurgical bond having a low electrical contact resistance.

4,015,100
SURFACE MODIFICATION

Daniel S. Gnanamuthu, Weymouth, and Edward V. Locke, Rockport, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Continuation-in-part of Ser. No. 431,240, Jan. 7, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,628
Int. Cl.² B23K *26/00*
U.S. Cl. 219—121 LM **9 Claims**



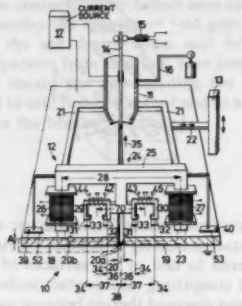
1. Surface layer production method comprising,
coating metal substrate with a coating layer comprising desired alloying ingredients,
relatively scanning a continuous wave laser beam of 1–20 kilowatts focused to a 0.025 to 0.7 inch diameter circle or area equivalent of other form over the coated surface in a linear trace at a rate of 5–500 inches per minute to melt the coating and a predetermined depth and width of the substrate surface along said linear trace and forcibly intermix the melted substrated layer and the entirety of the coating through mass transfer predominant over any diffusion mixing and rapidly cooling to produce a solid alloy casing and a substantial weight per cent of which is obtained from the substrate along said linear trace of the produced alloy composition throughout said predetermined depth,
the depth of melting being selected in relation to amount of minority alloying ingredients and the tine of residence in molten state and cooling rate and heat transfer conditions at said layer being controlled to produce a desired alloy composition and so that the secondary dendrite spacing of said alloy is 1–100 microns.

4,015,101
SCANNING DEVICE FOR WELDING TORCHES

Günther Hannappel, Frankfurt am Main, and Günther Hahn, Hausen, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Apr. 17, 1975, Ser. No. 568,889
Claims priority, application Germany, Apr. 20, 1974, 2419084
Int. Cl.² B23K *9/10*
U.S. Cl. 219—125 PL **7 Claims**

1. A device for controlling the automatic following of a welding tool along a welding gap between two workpieces, said device including:
a. a magnetic scanning device for scanning the welding gap without contacting the workpieces and being connected to the welding tool for controlling the movement thereof over the workpieces and along the welding gap, said scanning device comprising
i. a magnetic field generator for generating a magnetic flux through the workpieces and across the welding gap,
ii. a pair of transducer heads disposed for being arranged on both sides over the welding gap for sensing the magnetic flux perturbations along the welding gap,
b. a horizontal adjusting device for centering the tool and said scanning device over the welding gap, said adjusting device comprising
i. an adjusting motor
ii. said motor being electrically connected to the outlet of said transducer heads,
c. a control system for maintaining constant the distance of the scanning device from the workpieces, said control system comprising
i. a pair of capacitive detector heads disposed for being arranged on both sides over the welding gap,
ii. a vertical adjusting means electrically connected to

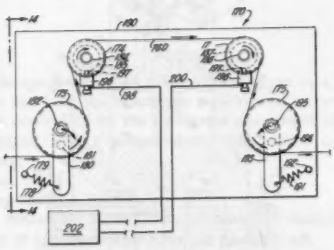


said detector heads for the height correction of said scanning device,
iii. difference amplifier means for forming a correction signal which is proportional to the average value of the two height signals from said detector heads,
iv. the outlets of each of said detector heads being electrically connected to said difference amplifier means, and
v. said difference amplifier means being electrically connected to the input of said adjusting motor of said horizontal adjusting device.

4,015,102
APPARATUS FOR MAKING AN ELECTRIC CONDUCTOR

Peter Zadorozny, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 1, 1975, Ser. No. 573,493
Int. Cl.² C21D *9/62*
U.S. Cl. 219—155 **9 Claims**



1. Apparatus for controlling the electrical resistance in a moving electrical conductor during its production, the conductor being a bundle of continuous filaments coated with a thermally curable liquid dispersion of conductive particles, the electrical resistance of the conductor being determined by the degree of thermal curing of the coating comprising:
a. a first rotatable contact member on a fixed axis position such that the moving conductor contacts the member;
b. means before the first member for controlling the tension in the conductor moving to the first member;
c. a second rotatable contact member on a fixed axis, the second member being spaced from the first member such

that the moving conductor contacts the second member after leaving the first member, the first and second members being on fixed axes so that the length of moving conductor between the members is kept at a constant length;

d. means for supplying current to the moving conductor at the first member to conduct a current along the constant length of conductor between the member;

e. means for measuring the voltage drop across the constant length of conductor and comparing that voltage drop with a standard voltage drop;

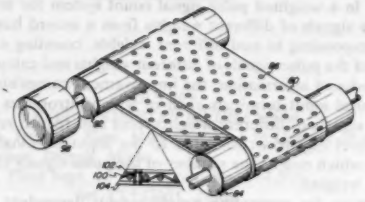
f. means for varying the resistance of the conductor by varying the extent of thermal curing of the coating when the voltage drop measured varies from the standard.

4,015,103

FUSER CONVEYOR BELT

Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 19, 1975, Ser. No. 551,213
Int. Cl.² H05B *1/00*; **G03G** *15/20*
U.S. Cl. 219—216 **2 Claims**



1. An apparatus for affixing permanently a powder pattern to a sheet of support material, including:

a resilient conveyor belt for transporting the sheet of support material with the powder pattern deposited on one surface thereof along a path of movement, said belt having a corrugated surface, allowing it to be extendable in a direction substantially parallel to the path of movement of the sheet of support.

means for moving and resiliently extending said belt so as to create a normal force thereon to maintain a frictional force between said belt and said moving means preventing relative movement therebetween;

means for heating said belt so as to raise the temperature of the surface of the sheet of support material in contact therewith; and

a radiant energy source in thermal communication with the sheet of support material so as to heat, and, thereby, permanently affix the powder pattern to the sheet of support material; and

said belt including a first layer of glass fibers woven to create a fabric having, in the unextended condition, a corrugation therein in a direction substantially parallel to the path of movement of the sheet of support material; and

at least a pair of layers of elastomeric material having said first layer interposed therebetween and secured thereto.

4,015,104

CONTROL SYSTEM FOR ELECTRICALLY OPERATED HEAT GENERATING APPARATUS

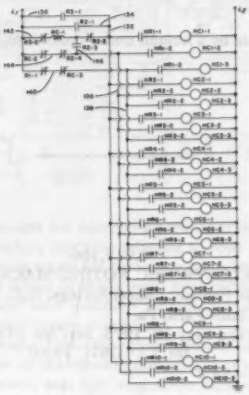
Raymond L. Eckman, Manlius, and Russell E. Wood, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,750
Int. Cl.² H05B *1/02*
U.S. Cl. 219—485 **8 Claims**

1. A control system for controlling the energization of electrically operated heat generating apparatus included in a multizone electrical heating system, the heating apparatus in each of said zones including at least two parallel connected heat generating stages, the heat generating apparatus in the various zones being connected in a parallel electrical arrangement, said control system comprising:

a source of electrical energy;

means for supplying said electrical energy to said heat generating apparatus including thermostatic means to sense the temperature in each zone served by said multizone heating system, individual thermostatic means being disposed in each separate zone to sense the particular temperature therein, said individual thermostatic means including a first switch to connect a first one of said stages



in a zone to said source of electrical energy when the temperature in said zone is at a first level below a desired level in said zone, said individual thermostatic means including a second switch to connect said other stage in said zone to said source of said electrical energy when the temperature in said zone is at a second level below the desired level, said first stage being maintained energized when the second stage is also energized; and

overriding means to prevent energization of said other stage irrespective of the temperature level in said zone, said overriding means being operable when the number of said first stages energized in each of said zones is greater than a preselected fraction of the total of said first stages.

4,015,105

PANEL ELECTRICAL HEATING ELEMENT

Stanley Austin Dunn, Madison, Wis., assignor to Bjorksten Research Laboratories, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 421,073, Dec. 3, 1973, Pat. No. 3,924,098, which is a continuation-in-part of Ser. No. 376,721, June 22, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,973
Int. Cl.² H05B *3/10*
U.S. Cl. 219—553 **1 Claim**

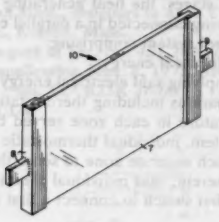
1. An electrical heating element in the form of a laterally extended member having a resistivity of 10^{-3} to 10^{3} ohm centimeters, operable at a surface temperature of 70° F. to 150° F. in the presence of moisture and oxygen without substantial degradation which

comprises a product of fusing from 4% to 30% by volume of finely comminuted particles consisting essentially of iron with a mixture of finely comminuted particles of recycled bottle glass,

having electrodes attached to opposite portions of said laterally extended member,

having from 100 to 135 volts applied across said electrodes,

having a leakage to ground from the surface below that



detectable by a human under conditions of 100% humidity.

4,015,106

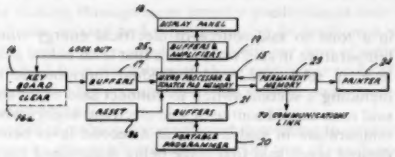
ELECTRONIC VOTING MACHINE

Thomas E. De Phillipo, Laurel Springs, N.J., assignor to EVM Limited, Elkins Park, Pa.

Filed May 20, 1975, Ser. No. 579,147

Int. Cl.² G07C *13/00*

U.S. Cl. 235—54 F **6 Claims**



1. An electronic voting machine for use by a voter in casting a vote in an election, said machine comprising:

a display panel, said panel including a plurality of selectively energized light sources located in pre-determined regions of said panel and means for locating a transparent overlay on said panel in registry with said regions, said overlay having printed thereon the names of the candidates to be voted upon and the party affiliation of said candidates,

a keyboard associated with said panel, said keyboard including a plurality of touch actuated switches with at least one switch being associated with each candidate,

a micro processor coupled by buffer means to said switches and to said light sources of said panel, said micro processor including means for accepting programming instructions that determine the responses of said light sources to said switches, said micro processor further including a scratch pad memory for storing the data indicating the nature of the state of said lamps on said panel,

means for altering any of the switch selected choices of said voter during the balloting of said voter,

a permanant memory for storing the contents of said scratch pad memory,

means for transfering the contents of said scratch pad memory to said permanent memory upon completion of the selection process by said voter,

means responsive to said transfer for rendering said machine inoperative until a subsequent voter is permitted access to said machine, and

means for programming said micro processor to conform the operation of said keyboard to said overlay in accordance with said election.

4,015,107

WEIGHTED PULSE SIGNAL COUNT SYSTEM

Shinichi Tanaka, Tenri; Kenji Sano, Osaka, and Seiji Kimura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 18, 1974, Ser. No. 515,866

Claims priority, application Japan, Oct. 19, 1973, 48-118035

Int. Cl.² G06K *7/10, 19/06;* G09B *7/00;* G06F *7/385*

U.S. Cl. 235—61.6 R **6 Claims**

2. In a weighted pulse signal count system for introducing pulse signals of different weights from a record having areas corresponding to said different weights, counting each number of the pulse signals of different weights and calculating the introduced information, the improvement comprising:

plural input terminals each of which introduces the pulse signals of different weights from said record areas;

plural registers connected to the input terminals each of which counts the number of the pulse signals of different weights;

means for generating weight signals dependent upon the weight of the pulse signals of different weights in a binary coded decimal notation; and

means for repeatedly adding the weight signals at different timings, each number of the repetition being identical with the counted number of the pulse signals of different weights introduced into the registers.

4,015,108

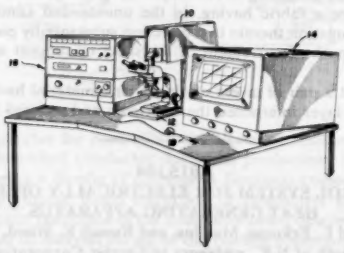
METHODS OF AND APPARATUS FOR DETERMINING THE PHYSICAL PARAMETERS OF SELECTED OBJECTS

Roger Roy Adams Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 434;529, Jan. 18, 1974, abandoned, which is a division of Ser. No. 210,278, Dec. 20, 1971, Pat. No. 3,805,028, which is a continuation of Ser. No. 835,673, June 23, 1969, abandoned. This application Nov. 28, 1975, Ser. No. 636,273

Int. Cl.² G06M *11/02*

U.S. Cl. 235—92 PC **22 Claims**



1. An analysis system for determining a value representative of a parameter of a selected feature in a field of view by dissociating from a video signal generated from the field of view that portion of the video signal representative of the selected feature, comprising:

video means for imaging and line scanning in a predetermined line scan format along lines traversing a plurality of features in the field of view and for generating a video signal representative of line scan intercepts with the features, from which the value of at least one parameter of the scanned features can be derived;

means to generate a position signal defining a position within the field of view of at least a single point to identify the selected feature;

means responsive to the position signal and the video signal for generating a first signal by comparing a signal generated from one line of scan as a function of the position signal, with a signal generated from a subsequent line of scan as a function of the position signal, including gating means responsive to the video signal and the first signal for generating a dissociated signal representative of the intercepts of the selected feature; and

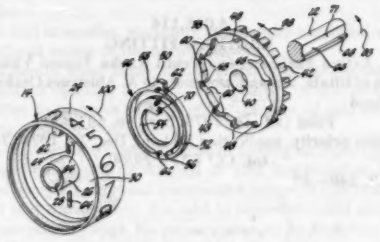
means for determining the value of the parameter as a function of the dissociated signal.

4,015,109

RESET ODOMETER MECHANISM

Kenneth R. Deming, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 19, 1975, Ser. No. 614,976
Int. Cl.² G01C *22/00*
U.S. Cl. 235—96 **3 Claims**



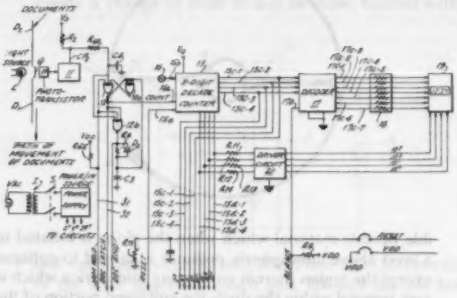
1. A rotary motion transfer mechanism for use in an odometer assembly of the type including a shaft on which are supported for rotation a number of counting wheels with pinion gears therebetween, one end portion of which is engaged by means on the adjacent lower order counting wheel located to the right of the pinion gear to produce rotation of the pinion gear with each revolution of the lower order counting wheel, the transfer mechanism comprising: a gear wheel mounted for rotation on the shaft and located to the right of each counting wheel with a circumferentially continuous gear tooth configuration on its righthand side for receiving a rotative input from the pinion gear to its right; said gear wheel having a number of detents formed on its leftward side; a ratchet spring mounted for rotation about the shaft and located between each counting wheel and gear wheel; said ratchet spring having inner and outer hoop portions of resilient material connected together by a bridge portion; means on the outer hoop of said ratchet spring for engaging one of said gear wheel detents to form a drive connection therebetween for rotation together during a counting mode of operation; means between said inner hoop portion and the shaft to permit simultaneous rotation together during a reset mode of operation whereby said gear wheel remains stationary and said outer hoop means slips from one detent to another adjacent detent made possible by simultaneous inward and outward flexing of said outer hoop portion.

4,015,110

ELECTRONIC CONTROL MEANS FOR PAPER COUNTING AND HANDLING MACHINES

Alan P. Jones, Levittown, Pa., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Sept. 15, 1975, Ser. No. 613,633
Int. Cl.² G06M *7/02, 3/12*
U.S. Cl. 235—925 B **17 Claims**



1. Electronic means for controlling the operation of paper handling and counting machine adapted to feed paper documents and the like in single file through a counting location so that the adjacent edges of documents are spaced by a minimum gap distance, said machine including a drive motor, wherein said control means comprises:

a light source and a light responsive element positioned on opposite sides of the moving documents at the counting location; whereby said light responsive element generates a count pulse during the time when the trailing edge of a document and the leading edge of the following document pass the counting location;

display means comprising counter means for accumulating said count pulses and a plurality of digit display means for collectively displaying a multidigit number responsive to said counter means representing the count in said counter means;

means coupled to said light responsive element for generating a jam signal when the time interval between the trailing edge of a count pulse and the leading edge of the next count pulse is greater than a predetermined threshold;

bistable circuit means being set to a first state responsive to a jam signal;

means responsive to the set state of said bistable means for stopping said motor;

means responsive to the set state of said bistable circuit means for resetting said counter means to a zero count;

flash means being activated responsive to the set state of said bistable circuit means for alternately disabling and enabling said display means to create a "flashing zero" display indicative of a jam condition.

4,015,111

INFLATABLE, CHEMI-LUMINESCENT ASSEMBLY

Donald Spector, 380 Mountain Road, Union City, N.J. 07087

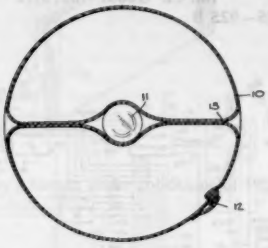
Filed Aug. 19, 1975, Ser. No. 605,809
Int. Cl.² F21V *9/16*
U.S. Cl. 240—2.25 **10 Claims**

1. A globular chemical lighting assembly comprising:

A. a chemi-luminescent device constituted by two separate chambers each containing one component of a two-component chemi-luminescent system and activating means to interconnect said chambers to intermingle said components and thereby cause a light-producing reaction, whereby said device is normally in a non-reactive state; and

B. an inflatable globe formed of translucent material and including conduit means communicating with the exterior of the globe adapted to receive said device and to hold it at a central position within the globe when the globe is

inflated, whereby by first activating the device and then inserting it in the conduit means, the globe then functions as a globular light emitter, said conduit means being constituted by an open-ended tubular duct extending diametrically through said globe and formed of collapsible flexible material which when the globe is inflated to a level above atmospheric pressure is caused to collapse except the region therein enveloping said device which is now trapped within the duct, the collapsed portion of the duct on either side of the trapped device acting as flattened straps to hold the device in place.

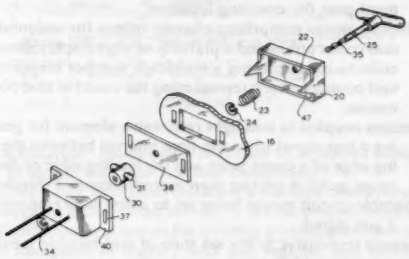


4,015,112

METHOD OF MAKING ILLUMINATED HANDBAG

Stanley C. Castaldo, 704 N. Lake Pleasant Road, Apopka, Fla. 32703

Filed Dec. 5, 1974, Ser. No. 529,702
Int. Cl.² A45C *15/06*
U.S. Cl. 240—6.45 P **9 Claims**



1. A method of making an illuminatable handbag comprising the steps of:

a. positioning a switch on an interior wall of a handbag;

b. positioning a latching clasp on an exterior wall of said handbag across said handbag wall from said switch;

c. operatively attaching said positioned clasp through said wall to said positioned switch whereby said switch is actuated by operation of said latching mechanism including inserting a protruding shaft from said latching clasp into a sleeve in said switch to operatively connect said latching clasp and said switch;

d. attaching an illumination source operatively connected to said switch to the interior of said handbag and including attaching a battery power source to said handbag operatively connected to said illumination source and to said switch to operate said illumination source when a circuit is completed through said switch whereby said illumination source will be actuated by said switch when said latching clasp is actuated; and

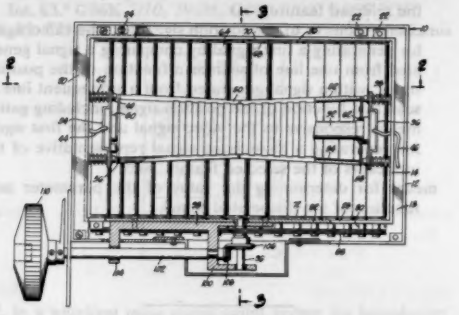
e. said latching clasp having a plurality of pointed protrusions which are pushed through said handbag wall and through flanges on said switch and then bent over said flanges to lock the latching clasp and switch together to the wall of said handbag.

4,015,113

APPARATUS FOR VARYING INTENSITY OF LIGHT

Robert E. Gottschalk, 10660 Chalon Road, Los Angeles, Calif. 90024

Filed May 2, 1975, Ser. No. 574,048
Int. Cl.² F21V *7/00*
U.S. Cl. 240—41.35 R **16 Claims**



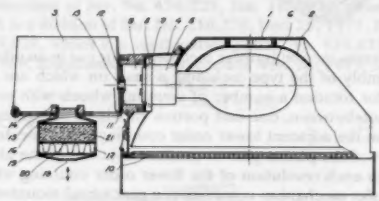
1. Reflector apparatus for use with a light source for varying the intensity of light received from said light source, comprising: a housing; and a plurality of adjacent reflector members each pivotally mounted for relative movement on said housing and positioned to reflect diffused light toward the light source, each of said members having at least first and second surface areas which receive light from said source, said first surface area having an average reflectivity different from the average reflectivity of said second surface area, and means for turning said reflector members.

4,015,114

LIGHTING FITTING

Paavo Antero Paajanen, and Pentti Kauko Tapani Väänänen, both of Iittala, Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

Filed Oct. 14, 1975, Ser. No. 621,832
Claims priority, application Finland, Dec. 20, 1974, 743739
Int. Cl.² F21V *29/00*
U.S. Cl. 240—47 **1 Claim**



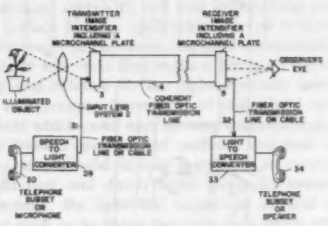
1. A light fitting comprising a ballast casing enclosing first means for communicating with a source of electrical current, a large shade provided with a reflector, second means connecting the ballast casing with the lamp shade, a bulb holder and a bulb mounted on said bulb holder, said bulb holder being located on said second means, third means defining a chamber surrounding said bulb, the ballast casing having a cover and defining together with said cover a cavity, a filter connected with said cover, said filter being placed away from said bulb whereby it is not substantially heated by the heat generated by the bulb when the light is on, fourth means for communicating said bulb chamber with the cavity defined by said ballast casing and said cover, an orifice in said filter located opposite said cover, said orifice providing for the flow of air from the bulb chamber to the surrounding when the light is on and when the air in the bulb chamber is under increased

pressure and providing for the flow of air from the surrounding into the bulb chamber when the light is turned off and the pressure in the interior of the bulb chamber becomes lower than the pressure in the surrounding, said filter comprising filter elements retaining dust, smoke and vapor and activated carbon as a filter element adsorbing gases, said filter being connected to said cover by means of a threaded joint, the filter being a casing of large diameter as compared with the size of the threaded joint.

4,015,115
PICTURE PHONE

Donald Gerald Corcoran, Montvale, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 9, 1975, Ser. No. 639,151
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 **41 Claims**


TRANSMITTER IMAGE INTENSIFIER INCLUDING A MICROCHANNEL PLATE
RECEIVER IMAGE INTENSIFIER INCLUDING A MICROCHANNEL PLATE
OBSERVER'S EYE
ILLUMINATED OBJECT
INPUT LENS SYSTEM
COHERENT FIBER OPTIC TRANSMISSION LINE
FIBER OPTIC TRANSMISSION LINE ON CABLE
SPEECH TO LIGHT CONVERTER
FIBER OPTIC TRANSMISSION LINE ON CABLE
LIGHT TO SPEECH CONVERTER
TELEPHONE SUBSET OR MICROPHONE
TELEPHONE SUBSET OR SPEAKER

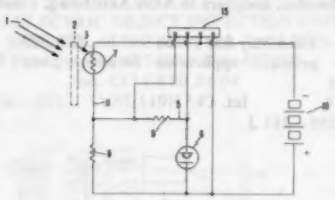
1. A picture communication system comprising:
at least a first image intensifier;
first means to optically couple an image of an illuminated picture to be transmitted to the input of said first intensifier;
said first intensifier providing an intensity amplified version of said image at the output thereof;
a coherent fiber optic transmission line having one end thereof optically coupled to the output of said first intensifier to transmit said amplified version of said image to the other end thereof;
at least a second image intensifier having its input optically coupled to said other end of said transmission line to intensity amplify said transmitted image at said other end of said transmission line and to reproduce said amplified transmitted image for presentation to an observer;
said first means including
a lens system to direct said image of said picture upon the input of said first intensifier;
each of said first and second intensifiers including
a proximity focused planar device having a microchannel plate for image amplification;
second means disposed between said lens system and said one end of said transmission line; and
third means disposed between said other end of said transmission line and said observer;
said second and third means cooperating to present said reproduced image as a colored image to said observer.

4,015,116
MEASUREMENT OF SOLAR RADIATION

Raymond J. Bahm, Albuquerque, N. Mex., assignor to Rho Sigma Corporation, Van Nuys, Calif.

Filed Oct. 20, 1975, Ser. No. 624,111
Int. Cl.² H01J 3/14
U.S. Cl. 250—206 **5 Claims**

1. A solar radiation measuring and recording system comprising:
an integrating solar radiometer and a solar recorder,
said integrating solar radiometer comprising:
a constant voltage source, a photo-resistive element, and a current integrating device connected in series,
said photo-resistive element having an electrical resistance inversly proportional to the radiation falling thereupon to produce a detectable change of state therewithin to control the current passing through said current integrating device,
and said solar recorder comprising:
a light-tight enclosure having a pin hole therein,
a medium, sensitive to a portion of the solar spectrum to create a change of state in said medium, located within

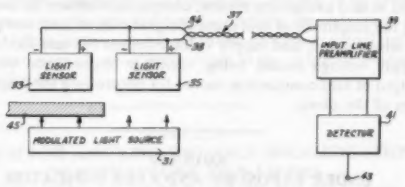


said enclosure, whereby only direct rays from said portion of the solar spectrum which pass through the pin hole impinge upon said medium,
and at least one sight attached to said enclosure,
said at least one sight comprising: a circular angular scale having equiangular divisions on a flat surface upon said enclosure, and a conical shaped pedestal in the center of said scale having the axis of the cone normal to said flat surface and the base of said pedestal lying in the same plane and said flat surface.

4,015,117
UNBIASED MODULATED PHOTO SENSING SYSTEMS

Joseph B. Wicklund, Jr., Bothell, Wash., assignor to Opcon, Inc., Everett, Wash.

Filed Aug. 28, 1975, Ser. No. 608,664
Int. Cl.² H01J 39/12
U.S. Cl. 250—208 **14 Claims**



1. A modulated photosensing system comprising:
a modulated light source producing light rays modulated at a frequency in the KHz range or above;
an unbiased photovoltaic device having a photosensitive surface positioned so as to receive at least a portion of the light rays produced by said modulated light source and produce an output in accordance therewith, the amount of light received and the resultant output being controlled by the presence or absence of an object located between said modulated light source and said unbiased photovoltaic device;
a cable including a pair of wires, one end of said pair of wires being directly connected to said at least one unbiased photovoltaic device;
a balanced, low impedance differential input line preamplifier, connected to the other end of said pair of wires for receiving the output of said unbiased photovoltaic device, said balanced, low impedance, differential input line preamplifier having an input impedance of 1000 ohms or less and a common mode rejection ratio of 40 db or more; and,
a detector connected to the output of said balanced, low impedance, differential input line preamplifier for detect-

ing when said preamplifier receives an output from said unbiased photovoltaic device indicating that said photovoltaic device is receiving light rays produced by said modulated light source.

4,015,118

CONTROLLING THE AMPLIFICATION IN A RADIATION DETECTING AVALANCHE DIODE

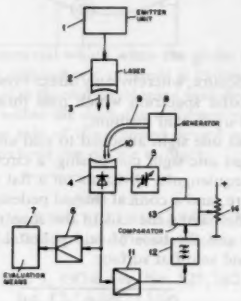
Karl-Gustaf Leif Andersson, and Klas Rudolf Wiklund, both of Taby, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed May 21, 1975, Ser. No. 579,369

Claims priority, application Sweden, June 5, 1974, 74073891

Int. Cl.² H01J *39/12*

U.S. Cl. 250—211 J **3 Claims**



1. Apparatus comprising a radiation detecting avalanche diode wherein said diode generates electric signals in dependence upon received radiation, evaluation means for receiving said electric signals, control signal selection means for deriving a control signal from said diode electric signals, said control signal having a frequency differing from the frequency used in said evaluation means, comparison means for comparing the amplitude of said control signal with at least one predetermined value, and supply voltage means for said diode, said supply voltage means being varied in accordance with the output of said comparison means for controlling the amplification of the diode.

4,015,119

UNDER EXPOSURE AND FADE INDICATOR

Teruhiko Miyake, Tokorozawa, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Dec. 24, 1975, Ser. No. 644,780

Claims priority, application Japan, Dec. 25, 1974, 50-2681

Int. Cl.² H01J *39/12*; **G03B** *21/36*

U.S. Cl. 250—214 D **3 Claims**

1. For a camera having an exposure control system driving a diaphragm and having a fade system, an indicator system for informing the camera operator of the status of the exposure control system and the status of the fade system, the exposure control system varying the opening of the diaphragm for correct film exposure in accordance with the brightness of a scene being photographed, and fade control circuitry gradually closing the diaphragm opening from the correct exposure opening during a fade-out sequence, and gradually opening the diaphragm opening from a substantially closed condition to the diaphragm opening for the correct exposure opening during a fade-in sequence, the indicator system being connected in combination with a camera control circuit comprising:

the camera control system including:

a power supply;

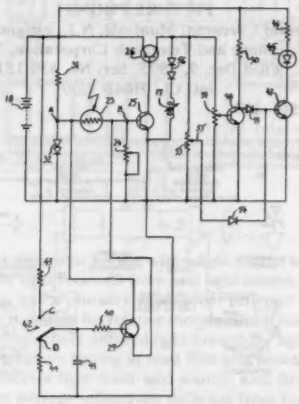
the exposure control system including:

a photocell in circuit with said power supply, having a resistance variable in response to the quantity of light inpinging thereon;

a meter in circuit with said photocell;

first circuit means connecting said photocell to said meter and said power supply for driving said meter in response to light impinging on said photocell to maintain constant said light impinging on said photocell; said circuit means including transistor means in circuit with said photocell to be made conductive when the resistance of said photocell varies from a predetermined value;

an indicator lamp;



second circuit means connecting said photocell and said power supply to said indicator lamp for energizing said lamp when an inadequate quantity of light impinges on said photocell causing said transistor means to become conductive;

third circuit means including fade means connecting said photocell, said meter, and said indicator lamp for altering the status of said meter independent of light impinging on said photocell wherein said indicator lamp is energized during selected conditions of said fade means; and

fourth means for selectively connecting said third circuit means with said first and second circuit means for causing initiation of a fade sequence.

4,015,120

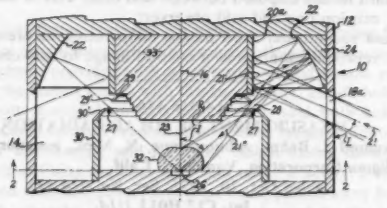
OPTICAL SYSTEMS AND ASSOCIATED DETECTING MEANS

Henry B. Cole, East Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 21, 1961, Ser. No. 90,887

Int. Cl.² H01J *3/14*

U.S. Cl. 250—216 **7 Claims**



1. An opaque hollow main supporting housing and a combined light-collecting and detecting system disposed within and surrounded by said main housing at a location intermediate its spaced opposite ends, said combined system being arranged to simultaneously view through a plurality of relatively small peripherally spaced light apertures in side wall

portions of said main housing all azimuths of a predetermined endless annular object field outwardly of said housing and in concentric relation to a longitudinal axis extending centrally through said housing and to detect any appreciable change in light intensity occurring at any location in said annular object field, said combined system comprising a single relatively small photosensitive detecting element disposed at a fixed axial location in said main housing, a plurality of similar relatively small light apertures circumferentially arranged in side wall portions of said housing and appreciably spaced from each other in such a predetermined manner as to have each aperture face outwardly toward a different sector of said endless annular object field and jointly simultaneously admitting into said housing light from all parts of said annular object field, an optical system aligned with each aperture and with said single photosensitive detecting element, and each optical system comprising first and second specularly reflecting surfaces, said first surface being a plane surface positioned within said housing in a plane substantially parallel to said longitudinal axis and at a location substantially midway between the aperture associated therewith and said longitudinal axis, and said second surface being a spherically curved concave surface having its center of curvature disposed substantially upon said longitudinal axis, said first surface being so disposed in said housing and relative to the light aperture associated therewith as to intercept substantially all of the light rays from said object field which enter said housing therethrough and to reflect same toward said second surface, and said second surface being so disposed in said system as to receive said reflected light rays and direct same generally toward said detecting element, the spherical curvature of said second surface being such as to focus the light rays being reflected thereby at a focal plane in said housing intermediate said second surface and said detecting element, and a positive lens element centrally disposed within said housing and in optical contact with said detecting element so as to collect the light rays passing beyond said focal plane and direct same onto said relatively small detecting element.

4,015,121

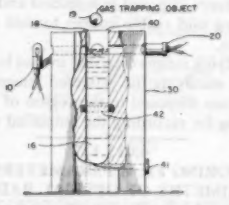
CATALSIMETER WITH TIME MEASURING CIRCUITRY FOR DETERMINING REACTANT CONCENTRATION LEVEL

Marcel Gagnon, St. Lambert; Michel Baril, Pointe Claire; Francois-Gros D'Aillon, Rosemere, and Claude Savoie, St. Basil Le Grand, all of Canada, assignors to Alica Instruments Co. Ltd., Montreal, Canada

Division of Ser. No. 487,615, July 11, 1974, Pat. No. 3,948,730. This application July 15, 1975, Ser. No. 596,166

Int. Cl.² G01D *21/04;* **G01N** *21/26, 21/28*

U.S. Cl. 250—221 **12 Claims**



2. A circuit for electronically measuring and displaying a readout of elapsed time for a gas-trapping object saturated with a medium containing a first reactant to buoyantly rise within and break the plane of the surface of a fluid containing a second reactant at a predetermined concentration in a container due to the reaction of said first and second reactants to produce a gas following said gas-trapping object having broken said plane and sunken in the fluid, said circuit comprising:

a. photo-detector means for producing a start pulse when said gas-trapping object breaks said plane to sink in said fluid and a stop pulse when said gas-trapping object buoyantly rises and again breaks said plane of said fluid;

b. clock means for displaying said elapsed time between said start pulse and said stop pulse, said elapsed time being of at least a predetermined duration thereby to be proportional to the concentration of said first reactant in said medium; and,

c. means for electrically connecting said clock means and said photo-detector means.

4,015,122

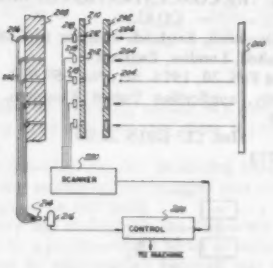
PHOTO-ELECTRIC OBJECT DETECTION SYSTEM

Walter M. Rubinstein, 25535 Briar, Oak Park, Mich. 48237

Filed July 12, 1974, Ser. No. 487,898

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **6 Claims**



1. A safety device of the type described, comprising: a constant radiation source, a plurality of radiation receivers; a single radiation detector; means for causing the radiation detector to sequentially monitor the conditions of the radiation receivers; means for developing timing signals in timed relation to the monitoring of individual radiation receivers by the radiation detector; a plurality of shift registers connected serially, having the outputs of the radiation detector provided as an input to the first register in the serial chain and the timing signals connected to advance the contents of all of the registers; means for simultaneously receiving the outputs of all of said shift registers and for generating an alarm signal upon the occurrence of a particular pattern in the outputs from said shift registers.

4,015,123

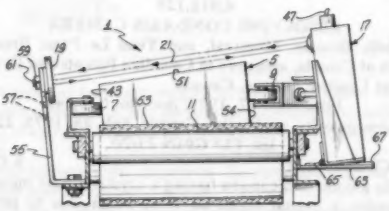
SYSTEM FOR ASSURING HOT FACE IDENTIFICATION OF REFRACTORY KILN LINERS

John F. Small, Dover, and Richard J. Shaffer, York, both of Pa., assignors to Dolomite Brick Corporation of America, York, Pa.

Filed Nov. 6, 1975, Ser. No. 629,419

Int. Cl.² G01D *21/04*

U.S. Cl. 250—223 R **10 Claims**



1. A system for placing an identifying mark on a specific surface portion of an irregular article, which system comprises, in combination: means for supporting and moving the article among a given route; a first sensing means positioned

along said route for ascertaining if said specific surface portion of said irregular article is in the desired orientation for marking, by means of a scan line of detection positioned adjacent and parallel to the plane of a given side of the moving irregular article such that incorrect orientation of the article will be evidenced by interruption of the scan line of detection by the article; marking means positioned further along said route for applying an identifying mark to said specific surface portion of a properly oriented article; and a second sensing means positioned downstream from said marking means for ascertaining the presence of a sufficient identifying mark on the specific surface portion of said article.

4,015,124

DETERMINING THE CONCENTRATION OF SULPHUR IN COAL

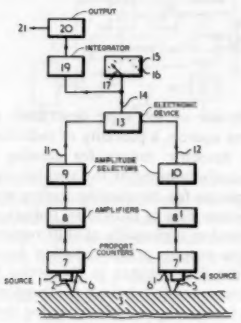
Dennis Page, Gateshead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 20, 1976, Ser. No. 659,972

Claims priority, application United Kingdom, Mar. 14, 1975, 10713/75

Int. Cl.² G01N *23/00*

U.S. Cl. 250—273 **15 Claims**



1. A method for continuously measuring the concentration of sulphur in coal, including the steps of bombarding a sample of coal with electromagnetic radiation in the X-ray region of the spectrum to cause the iron and sulphur atoms in the sample to emit their characteristic fluorescent radiations, detecting said fluorescent radiations, measuring the intensities of said fluorescent radiations, and combining the measures mathematically to produce an output from which the concentration of sulphur in the sample may be determined.

4,015,125

RESOLVING CONE-AXIS CAMERA

Gabrielle Donnay, Montreal, and Yvon Le Page, Brossard, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 17, 1975, Ser. No. 632,849

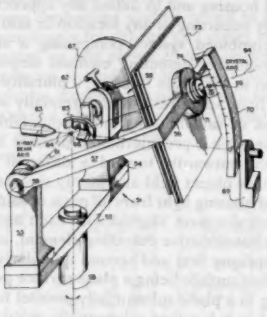
Claims priority, application Canada, Feb. 28, 1975, 221018

Int. Cl.² G01N *23/20*

U.S. Cl. 250—275 **8 Claims**

2. In a cone axis camera having a crystal holder means for processing a crystal about an x-ray beam axis to produce diffraction spots from successive levels of the reciprocal lattice of the crystal which are recorded on a film that is mounted in a film holder which maintains the film parallel to the reciprocal lattice of the crystal at a fixed distance from the crystal along the crystal axis:

means for providing a predetermined offset point on said film with an additional translation motion in the plane of



the film such that said offset point follows a circular path which has the crystal axis as its center.

4,015,126

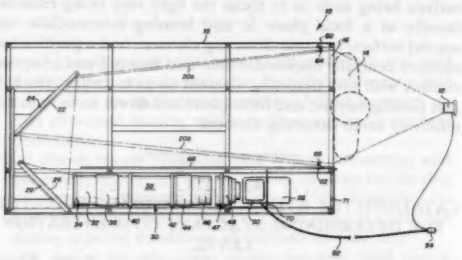
X-RAY INTENSIFICATION AND MINIFICATION SYSTEM

James R. Herrington, Garland, Tex., assignor to Varo Semiconductor, Inc., Garland, Tex.

Filed Oct. 10, 1975, Ser. No. 621,405

Int. Cl.² G03B *5/17*

U.S. Cl. 250—320 **39 Claims**



1. A radiation minification and recording system comprising:

a housing,

a screen in a first end of said housing for being positioned to receive radiation and for converting the radiation into visible images,

reflecting surfaces disposed in a second end of said housing for reflecting said visible images toward said first end of said housing,

image intensifying means disposed in said housing for intensifying and minifying the reflected images, and

recording means disposed in the region of said first end of said housing for recording the amplified minified images.

4,015,127

MONITORING FILM PARAMETERS USING POLARIMETRY OF OPTICAL RADIATION

Allen J. Sharkins, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 30, 1975, Ser. No. 627,248

Int. Cl.² G01J *4/04*

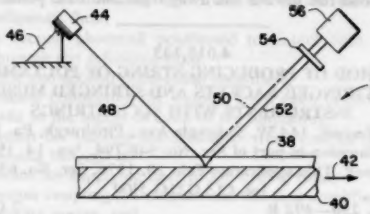
U.S. Cl. 250—341 **34 Claims**

1. A method of monitoring physical parameters of films or coatings having first and second at least partially reflective surfaces, including the steps of:

directing a beam of optical radiation having at least a portion thereof which will be absorbed by the film onto said first surface at a predetermined angle so as to plane pola-

rize any radiation reflected from said first surface and transmitting at least a portion of the radiation through said film to said second surface;

reflecting the transmitted radiation from said second surface back through said film;



transducing said radiation reflected from said second surface having a narrow band width with respect to which the film is absorptive to provide an output signal which is a function of absorption of said radiation by said film; and

polarizing said radiation to be transduced to block any component of said radiation other than that transmitted through said film.

4,015,128

DEVICE FOR AND METHOD OF CONTROLLING THE LEVEL IN APPROPRIATE CONTAINERS OF A LIQUID WHICH WILL EMIT INFRA-RED RAYS AND, IN PARTICULAR, THE LEVEL OF MOLTEN METAL

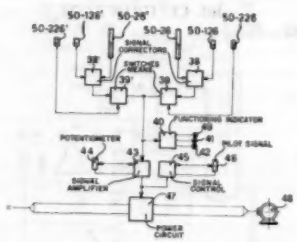
Ferruccio Della Vedova, Pozzuolo Del Friuli, Italy, assignor to CEDA, S.p.A., Buttrio (UD), Italy

Filed July 28, 1975, Ser. No. 599,477

Claims priority, application Italy, Sept. 26, 1974, 83404/74; Sept. 26, 1974, 83405/74

Int. Cl.² G01N *21/26*

U.S. Cl. 250—342 **25 Claims**



1. A device for controlling the level in a container of a liquid which will emit infra-red rays comprising in reciprocal coordination and cooperation a housing, at least one longitudinal window constructed and arranged at one end of said housing, at least one photo-element in cooperation with said window for sending out an electrical signal through said window to a liquid in a container, at least a second window constructed and arranged at said one end of said housing which is substantially punctiform, a second photo-element in cooperation with said second window for sending out a pilot signal, and circuitry in cooperation with said photo-elements for correcting, amplifying, and comparing said signals.

4,015,129

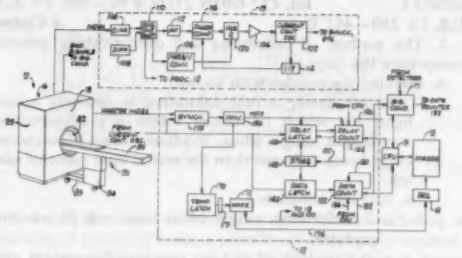
POSITION INDICATING CONTROL METHOD AND APPARATUS IN RADIATION SCANNING SYSTEMS

John Michael Manring, Cleveland Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,949

Int. Cl.² G01N *23/08*

U.S. Cl. 250—360 **50 Claims**



1. A system for indicating motion of a member of a radiation sensing apparatus movable along a path, said system comprising:

a. an incremental encoder producing index signals each indicating motion by said member past one of a plurality of locations on said path;

b. circuitry for multiplying the frequency of said index signals by a predetermined factor to define gradations of traversal by said member between said path locations; and

c. phase lock loop circuitry including a phase comparator having an output and being coupled to said frequency multiplying circuitry to facilitate the maintenance of a constant value for said predetermined factor so that said multiplied signals accurately represent uniform gradations of said traversal between said path locations.

4,015,130

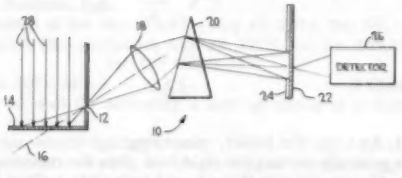
METHOD AND APPARATUS FOR MONITORING OPTICAL RADIATION

Robert Joseph Landry, Poolesville; Robert G. Bostrom, and Richard W. Peterson, both of Rockville, all of Md., assignors to The United States of America, Washington, D.C.

Filed Oct. 7, 1975, Ser. No. 620,375

Int. Cl.² G01J *1/42*

U.S. Cl. 250—372 **16 Claims**



1. Apparatus for monitoring radiation from a source thereof to which a biological system may be exposed, said radiation having a known effect on said biological system, which comprises:

means for spectrally dispersing the radiation emitted from said optical radiation source;

means for masking a portion of the output of said spectral dispersion means in accordance with a predetermined wavelength-dependent sensitivity similar to the biological system desired; and

means for detecting the intensity of the portion of radiation passed by said masking means.

4,015,131
MULTI-DETECTABLE INK COMPOSITIONS AND METHOD OF USE

William F. McDonough, Trumbull; James A. Montlick, Darien, and Richard A. Bernard, Norwalk, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 433,806, Jan. 16, 1974, Pat. No. 3,928,226. This application Dec. 15, 1975, Ser. No. 641,079

Int. Cl.² G01N *21/38*

U.S. Cl. 250—461 R **4 Claims**

1. The method of processing and distinguishing articles comprising the steps of

A. marking the articles with an ink,

1. said ink having a first coloration in ordinary mixed light, but which fluoresces within a predetermined wavelength range when irradiated, said fluorescent color being different than the mixed light color of said ink,

a. said ink containing

i. 2 to 25% by weight of at least one fluorescent pigment,

ii. 0.3 to 10% of at least one non-fluorescent pigment,

iii. 0.25 to 5% gellant, and

iiii. 0 to 1% antioxidant

iiiii. all being in an ink vehicle essentially comprising the remainder of said ink; then

B. processing the articles by detection means comprising a detector responsive to at least the fluorescent wavelength of said ink,

whereby said articles may be processed by a machine having at least fluorescent detection means covering the range of fluorescent wavelength of said ink and said articles may be further optically processed by differentiation of the mixed light color of said inks.

4,015,132
X-RAY FILM HOLDER

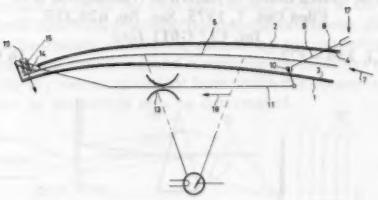
Jürgen Buschbeck, Norderstedt, and Wilfried Pfeiffer, Quickborn, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,462

Claims priority, application Germany, Aug. 3, 1974, 2437453

Int. Cl.² G03C *5/16*

U.S. Cl. 250—481 **1 Claim**



1. An x-ray film holder, comprising:

a generally rectangular rigid base plate for receiving x-ray film on one side thereof, said base plate arching toward the x-ray film from first and second opposing edges thereof;

a flexible cover plate for said base plate;

first and second rods supporting said flexible cover plate along first and second edges thereof corresponding respectively to said first and second opposing edges of said base plate;

two lever arms supporting opposite ends of said first rod for displacing said first rod toward said base plate and flexing said cover plate about and against said base plate, said arms being pivotable about a common axis which is parallel to said first edge of said base plate and in substantially the plane of said base plate at a position intermediate said first and second edges thereof;

a trunnion supporting each end of said second rod; and

a guide rod corresponding to and longitudinally displaced by each of said lever arms, each of said guide rods having a slot supporting one of said trunnions for displacing said second rod toward and away from said base plate.

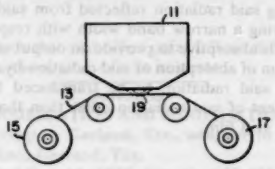
4,015,133
METHOD OF PRODUCING STRING OF POLYAMIDE AND STRINGED RACKETS AND STRINGED MUSICAL INSTRUMENTS WITH SUCH STRINGS

Harry Ferrari, 144 W. Swissvale Ave., Pittsburgh, Pa. 15218

Continuation-in-part of Ser. No. 540,794, Jan. 14, 1975, abandoned. This application Feb. 10, 1976, Ser. No. 656,808

Int. Cl.² G21G *5/00*

U.S. Cl. 250—492 R **7 Claims**



1. The method of substantially improving the elasticity and decreasing and damping of string composed of polyamide for stringed apparatus which comprises irradiating the string with radition, the magnitude of the energy of said radiation being in the range between the energy for which cleavage is predominately produced and the energy for which linkage alone is produced, so that a decrease in the modulus of elasticity of the treated string is accompanied by a decrease in the damping loss coefficient of the treated string.

4,015,134
APPARATUS FOR CONTROLLING THE ABSORPTION OF ONE OR MORE COLOR COMPONENTS CONTAINED IN A TEXTILE DYEING FLUID

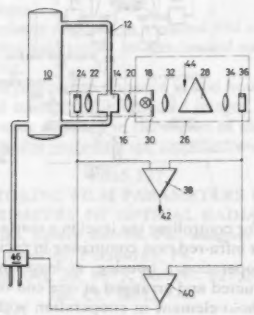
Walter H. Sturm, Hanau, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Mar. 31, 1976, Ser. No. 671,930

Claims priority, application Germany, Apr. 9, 1975, 2515499

Int. Cl.² G01N *21/28*

U.S. Cl. 250—565 **10 Claims**



1. An apparatus for optimally controlling the attachment of at least one color component in a dyeing fluid to textile goods by regulating the temperature of the dyeing fluid as a function of its transparency, comprising:

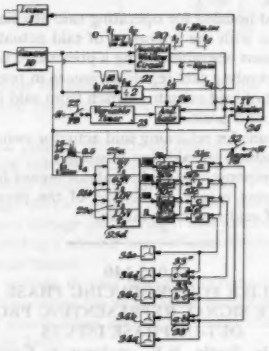
a. a light source,

b. means for directing light from the source through the dyeing fluid,
c. a first photocell positioned to detect light passing through the dyeing fluid,
d. a transparent container of varying width containing a reference fluid,
e. means for directing light from the source through the reference fluid,
f. a second photocell positioned to detect light passing through the reference fluid,
g. first and second differential amplifiers,
h. means connecting the outputs from each of the photocells to the inputs of each of the amplifiers,
i. means for moving the container transverse to the light passing through it,
j. means for supplying heat to the dyeing fluid,
k. means coupling the output from the first amplifier to the moving means, and
l. means coupling the output from the second amplifier to the heat supplying means.

4,015,135
METHOD AND APPARATUS FOR PARTICULATE MONITORING

Douglas F. Tipton, Jr., Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jan. 10, 1975, Ser. No. 539,982
Int. Cl.² G01N *15/02*
U.S. Cl. 250—574 **12 Claims**

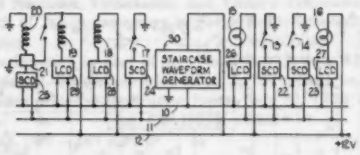


1. Apparatus for the real time measurement of the size and number of fluid-suspended particles in general conformity with the Mie Theory comprising a pulsed monochromatic radiation source directing a collimated illuminating beam into the fluid suspension of said particles, means directing particle-scattered radiation to a two-dimensional multiple sensor radiation detector, and electronic means measuring in real time particle size and particle number responsive to said multiple sensor radiation detector, the pulse interval of said radiation source being preselected in time duration to afford complete examination of a given sample of said fluid suspension.

4,015,136
ELECTRICAL SYSTEMS FOR ROAD VEHICLES

William David Holt, Colne, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Sept. 16, 1975, Ser. No. 613,807
Claims priority, application United Kingdom, Sept. 19, 1974, 40843/74
Int. Cl.² H02J *1/08*
U.S. Cl. 307—10 R **3 Claims**



1. In an electrical system for a road vehicle including a plurality of electrical loads, a plurality of swtiches for controlling the respective loads, at least some of the loads being remote from their associated switches, a plurality of load control devices selectively operable for connecting the loads to a common conductor, a plurality of switch control devices selectively operable for connecting the switches to the common conductor, and scanning means for sequentially operating the load control devices one at a time and for synchronously operating the switch control devices so that each load is periodically connected to its associated switch, and wherein each load control circuit includes a latch circuit which is reset after a time delay exceeding the period between successive connections of the load to its switch means, the improvement in which said scanning means includes a further conductor connected to all of the switch control devices and all of the load control devices, each control device including a voltage level detecting circuit which renders the control device operative when an appropriate control signal voltage level is present on the further conductor, the levels at which the switch control devices are operative being different and each load control device being operative at the same level as its associated switch control device, and a control signal generator for applying to said further conductor a cyclically repeated sequence of control signal voltage levels to render the control devices operative sequentially.

4,015,137
CONTROL FOR ACTIVATING MOTOR VEHICLE ELECTRICAL LOAD

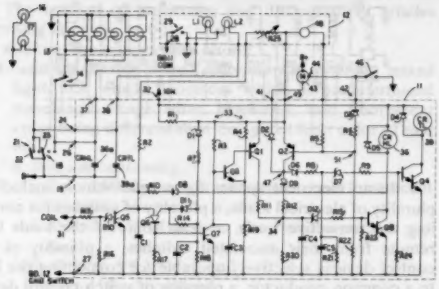
Richard A. Kniesly, Kokomo; Larry L. Colville, and Jerrold L. Mullen, both of Anderson, all of Ind., assignors to Ko An, Inc., Kokomo, Ind.

Division of Ser. No. 470,971, May 17, 1974, Pat. No. 3,909,619. This application Apr. 14, 1975, Ser. No. 568,014
Int. Cl.² H02G *3/00*
U.S. Cl. 307—10 LS **3 Claims**

1. A control for activating a lighting circuit in a motor vehicle comprising:
a motor vehicle lighting circuit;
photosensitive means for producing an electrical signal dependent upon the level of ambient light of the motor vehicle;
first relay circuit means, having an input, for coupling electrical power to the lighting circuit when the input of the first relay circuit means is energized;
electronic switching means for energizing the input of said first relay circuit means in response to the electrical signal of the photosensitive means;
said lighting circuit including the motor vehicle taillight circuit;
a motor vehicle headlight circuit;
second relay circuit means, having an input, for coupling electrical power to the headlight circuit when the input of

the second relay circuit means is energized, the electronic switching means including means for energizing the input of the second relay circuit means in response to the electrical signal of the photosensitive means;

ignition circuit means, having an input coupled to ignition pulses in the ignition system of the motor vehicle, for producing at an output a first electrical signal dependent upon the frequency of the ignition pulses;



reference circuit means for producing at an output a reference electrical signal; and

comparison circuit means, having a first input coupled to the output of the ignition circuit means and having a second input coupled to the output of the reference circuit means, for energizing the input of the second relay circuit means when the first electrical signal from the ignition circuit means differs from the reference electrical signal by a predetermined amount.

4,015,138

SEQUENCE CONTROL CIRCUIT

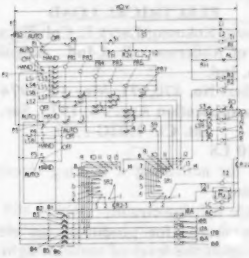
John Frederick Collett Andrews, Lingfield; Edward Stanislaw Budzinski, Ickenham, and David Henry Pearson, Harrow, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 18, 1974, Ser. No. 516,076

Claims priority, application United Kingdom, Nov. 2, 1973, 50987/73

Int. Cl.² H02J *1/00, 3/00*

U.S. Cl. 307—41 **14 Claims**



1. A sequence control circuit for an automatic sequence control system comprising a power supply, a plurality of limit switches separately connected to the power supply and each arranged to be associated with a separate movement of an operation of apparatus to be controlled, position proving switches having power-driven operators connected respectively with each limit switch, the position proving switches being arranged to be operated when a limit switch has reached an extreme position, a plurality of contacts connected to operators of the proving switches, and a multiple contact stepping switch adapted to initiate each next stage in the sequence, the contacts of the stepping switch being connected with selected contacts of the said proving switches and selected limit switches to enable sequential circuits to be completed and supply power to stepping means connected to the stepping switch to step the stepping switch through its sequence.

4,015,139

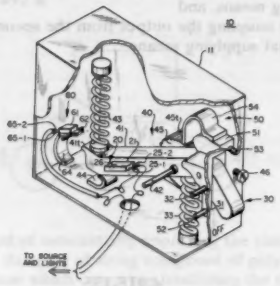
CONTROLLED DURATION SWITCH

John M. Cleary, 426 Washington Valley Road, Martinsville, N.J. 08836, and John P. Mohrhauser, 7 Washington Ave., Avon-by-the-Sea, N.J. 07717

Filed May 6, 1975, Ser. No. 574,955

Int. Cl.² H01H *43/00*

U.S. Cl. 307—141 **15 Claims**



1. An electrical control system, comprising

a housing;

a switch actuator mounted in said housing for movement between a first position and a second position;

an auxiliary switch mounted in said housing for movement between a first position and a second position;

means in said housing and extendable outwardly therefrom for connecting said auxiliary switch to an energy source and a load;

means in said housing for operating said auxiliary switch in accordance with the operation of said actuator switch;

regulator means operable during a prescribed time interval;

means for actuating said regulator means in response to the movement of said actuator switch from said first position to said second position;

restoring means for returning said actuator switch from said second position to said first position;

and means responsive to said regulator means for activating said restoring means at the end of the prescribed time interval of said regulator means.

4,015,140

MULTIPLIER FOR PRODUCING PHASE SHIFT ERROR-FREE SIGNAL REPRESENTING PRODUCT OF OUT-OF-PHASE INPUTS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Dover, N.H.

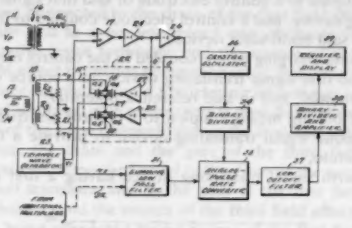
Division of Ser. No. 474,519, May 30, 1974, Pat. No. 394,763. This application Dec. 5, 1975, Ser. No. 638,004

Int. Cl.² G06G *7/12*

U.S. Cl. 307—229 **9 Claims**

1. A multiplier for producing an output signal free of phase shift error and representative of the product of two out-of-phase input analog signals comprising means for generating a cyclically varying reference signal, comparator means for linearly superimposing said reference signal and one of said analog signals to form a pulse train width-modulated in accordance with the comparison of said reference signal with the one analog signal, a selectively actuated bipolar switch directly coupling the other analog signal that is out-of-phase

with said one analog signal to the multiplier output, said switch being actuated by the width-modulated pulse train to form at the multiplier output an output pulse train which is



width-modulated in accordance with the one analog signal and amplitude-modulated in accordance with the other analog signal.

4,015,141

APPARATUS FOR COMPARING VOLTAGES

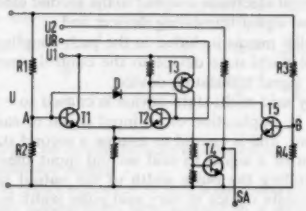
Herbert Reiter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1974, Ser. No. 529,496

Claims priority, application Germany, Dec. 4, 1973, 2360364

Int. Cl.² H03K *5/153, 5/08*

U.S. Cl. 307—235 N **2 Claims**



1. Apparatus for indicating when an input voltage reaches predetermined lower and upper threshold voltage levels comprising:

differential comparator circuit means,

a reference voltage source coupled to a first input of said differential comparator circuit means,

first voltage divider means connected across terminals for said input voltage and having a first junction point therein connected to a second input of said differential comparator circuit means,

said first voltage divider being constructed to produce an output exceeding the value of the output of said reference voltage source when said input voltage reaches said lower threshold level,

a transistor output stage, the conductive state of which is changed for produ ing an output signal having a first value when said lower threshold level at said first voltage divider exceeds the voltage level of said reference voltage source,

second voltage divider means connected across the terminals for said input voltage and having a second junction point therein,

said second voltage divider being constructed to produce an output voltage exceeding the reference voltage level when the said input voltage reaches said upper threshold level and

switching means coupled to said second junction point as to have its conductive state changed when said upper threshold level appears at said second voltage divider,

said switching means being coupled to said transistor output stage, the conductive state of which is changed for producing an output signal having a second level when said switching means has changed its conductive state.

4,015,142

ELECTRIC TIMING CIRCUITRY WITH MEANS TO COMPENSATE FOR SWITCH CHATTER

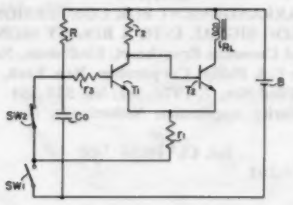
Shinji Nagaoka, Yotsukaido, and Yuzuru Takazawa, Togane, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 598,073, July 22, 1975, abandoned. This application Sept. 2, 1975, Ser. No. 609,537

Claims priority, application Japan, July 22, 1974, 49-87188

Int. Cl.² H03K *17/00*

U.S. Cl. 307—247 A **2 Claims**



1. An electric timing circuitry connectable to a source of electric energy during use and of the type having a switching circuit switchable to one state after the closing of a normally open source switch to effect current flow through a load and switchable to another state to terminate current flow through said load, and a timing circuit including a series connection of a resistor and capacitor having a junction point connected to said switching circuit and operable in response to the opening of a normally closed starting switch to initiate the running of a predetermined time period and effect switching of said switching circuit from said one state to said another state after the elapse of said predetermined time period: means for compensating for switch chatter of said source switch comprising means connecting said source switch and starting switch in a series circuit and connecting said series circuit in parallel with said capacitor so that said capacitor performs the dual function of a chatter-compensating capacitor for said source switch and a timing capacitor for said timing circuit.

4,015,143

SEMICONDUCTOR SWITCH

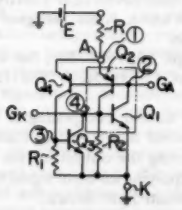
Michio Tokunaga, Zushi; Ichiro Ohhinata, Yokohama, and Shinzi Okuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 7, 1975, Ser. No. 556,326

Claims priority, application Japan, Mar. 11, 1976, 49-27115; July 19, 1974, 49-82185

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 J **9 Claims**



1. A semiconductor switch comprising:

a PNPN switch having at least three PN-junctions and having a P-type anode, an N-type gate, a P-type gate and an N-type cathode;

switching means having input, output, and control terminals;

a passive element; and

driver means for driving the control terminal of said switching means, the input and output terminals of said switching means and said passive element both being connected across one of said PN-junctions at one end of said PNPN switch; with said drive means supplying to the control terminal of said switching means a current divided from a current flowing through another one of said PN-junctions at another end of said PNPN switch thereby driving said switching means.

4,015,144

CIRCUIT ARRANGEMENT FOR CONVERSION OF AN ANALOG SIGNAL INTO A BINARY SIGNAL

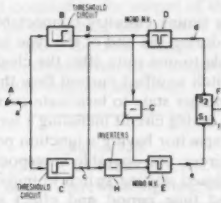
Freddy Achiel Cornelius Brouckaert, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,584

Claims priority, application Netherlands, Nov. 21, 1973, 7315904

Int. Cl.² H03K 5/00

U.S. Cl. 307—261 **4 Claims**



1. A circuit arrangement comprising input means for receiving an analog signal; two threshold limiter circuits each having a signal threshold differing from each other, an input coupled to said input means, and an output; two monostable multivibrators each coupled to both of said limiter circuit outputs and each having an output; said monostable multivibrators responding to threshold crossings of differing directions respectively, and a flipflop circuit coupled to said multivibrator outputs and having an output means for supplying a digital signal having transitions as a function of the analog signal passing said signal thresholds; whereby said circuit arrangement is operable to regard as redundant and without effect second crossings of the two thresholds in the same direction but to respond to each crossing of either threshold in a direction which differs from that of the previous threshold crossing.

4,015,145

VOLTAGE COMPENSATED TIMING CIRCUIT

John W. Stewart, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Sept. 19, 1975, Ser. No. 614,808

Int. Cl.² H03K 5/13, 1/12

U.S. Cl. 307—293 **1 Claim**

1. An electrical circuit comprising a multi-state device having first and second inputs and at least one output, with said output constituting the output for the circuit;

input means for applying an input signal to a first one of said inputs of said multi-state device;

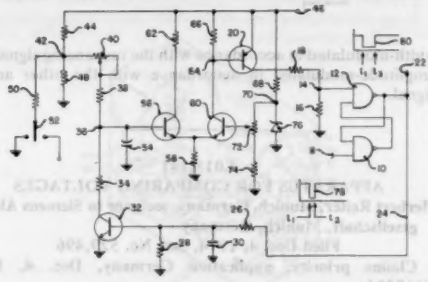
first and second signal translating devices having a corresponding first electrode of each coupled together and to a reference potential over an impedance, and having a corresponding second electrode of each coupled over an impedance to a source of potential;

a third signal translating device having a first electrode coupled to a reference potential, a second electrode coupled to a control electrode of said first signal translating device, and a control electrode coupled to the output of said multi-state device;

variable charging means coupled to the control electrode of said first signal translating device, to a source of circuit potential, and to said reference potential;

fixed biasing means coupled to a control electrode of said second signal translating device to provide a fixed bias thereto;

a fourth signal translating device having a first electrode



coupled to a source of potential, a second electrode coupled to a second input of said multi-state device, and a control electrode coupled to the second electrode of the second signal translating device; and

time delay means included in the path coupling the output of the multi-state device to the control electrode of the third signal translating device;

whereby said multi-state device is caused to assume a first state by application of an input signal to said first input thereof, and is caused to assume a second state by application of a signal to said second input thereof, thereby controlling the pulse width of the output signal of said multi-state device to vary said pulse width in accordance with the magnitude of the voltage of said source of circuit potential.

4,015,146

NEGATIVE RESISTANCE NETWORK

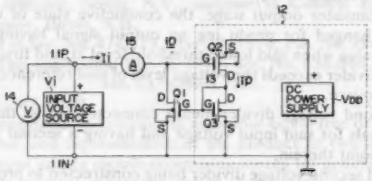
Mitsuo Aihara, Tokyo; Shigeho Takada, Ooita, and Hisaharu Ogawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 16, 1975, Ser. No. 641,385

Claims priority, application Japan, Dec. 16, 1974, 49-144874

Int. Cl.² H03K 3/53

U.S. Cl. 307—304 **4 Claims**



1. A negative resistance network having positive and negative input terminals to which a predetermined input voltage is applied comprising

a first predetermined channel insulated gate enhancement

field effect transistor with a drain-source path connected across the positive and negative input terminals;

a second insulated gate enhancement type field effect transistor of an opposite channel type to the first field effect transistor, the gate of the second field effect transistor being connected to the drain of the first field effect transistor and to a predetermined one of the positive and negative input terminals, and the source of the second field effect transistor being connected to one pole of a dc power supply having a predetermined voltage; and

a third insulated gate enhancement type field effect transistor of the same channel type as the first field effect transistor, the drain and the gate of the third field effect transistor being connected to the drain of the second field effect transistor and to the gate of the first field effect transistor, and the source of the third field effect transistor being connected to the source of the first field effect transistor, to the other input terminal and to the other pole of the dc power supply.

4,015,147

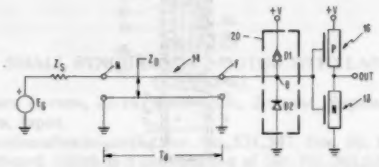
LOW POWER TRANSMISSION LINE TERMINATOR

Evan E. Davidson, Hopewell Junction, and Ralph D. Lane, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 483,269, June 26, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,462

Int. Cl.² H01L *27/04, 29/48;* **H03K** *5/08;* **H01P** *1/26*

U.S. Cl. 307—304 **5 Claims**



1. An integrated circuit structure comprising:

a semiconductor body;

a first field effect transistor having source and drain regions of a first conductivity type formed in a semiconductor region of a second conductivity type within said body;

a semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type is proximity to said first field effect transistor;

a second field effect transistor having source and drain regions of the second conductivity type formed in the said semiconductor region of said first conductivity type, such that a parasitic bipolar transistor latch is formed in said semiconductor body, said bipolar transistor latch including three P-N junctions, the first P-N junction being formed by the source region of said first field effect transistor and the semiconductor region of the second conductivity type within the semiconductor body, the second P-N junction being formed by the semiconductor region of the second conductivity type within the semiconductor body and the semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type, the third P-N junction being formed by the semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type and the drain region of said second field effect transistor, said three P-N junctions being sufficiently closely spaced for transistor action;

a first potential source directly coupled to the source region of said first field effect transistor;

a second potential source directly coupled to the source region of said second field effect transistor;

a transmission line having a near end and a far end,

a conductive path connecting the drain region of said first field effect transistor and the drain region of said second field effect transistor forming an output connected to the near end of said transmission line; and

a pair of reverse biased terminator diodes connected in series and also connected to said transmission line for preventing reflected signals on said transmission line from setting said parasitic bipolar transistor latch.

4,015,148

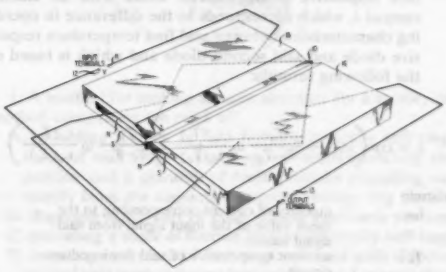
HALL EFFECT DEVICE FOR USE IN OBTAINING SQUARE OR SQUARE ROOT OF A VOLTAGE AMPLITUDE

Robert Lee Wallace, Jr., Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 5, 1976, Ser. No. 683,499

Int. Cl.² H03K *17/90, 19/18;* **H01L** *27/22, 29/82*

U.S. Cl. 307—309 **2 Claims**



1. In a Hall effect device comprising semiconductive material, a magnet establishing a magnetic field which passes in a first direction through said material, a pair of terminals connected to said material so that the straight line path therebetween is substantially perpendicular to the path of said magnetic field, and a second pair of terminals connected to said material so that the straight line path therebetween is substantially perpendicular to both said magnetic field path and said path of said first terminals, AN IMPROVEMENT CHARACTERIZED IN THAT

means are provided for reversing a portion of said magnetic field where said portion intersects part of the straight line path between said first pair of terminals and also part of the straight line path between said second pair of terminals.

4,015,149

TEMPERATURE COMPENSATING DEVICE FOR DEVICES HAVING SEMICONDUCTORS

Tokuichi Tsunekawa, Yokohama; Masanori Uchidoi; Tetsuya Taguchi, both of Kawasaki; Yoshiyuki Takishima, Machida; Tadashi Ito, Yokohama, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,445

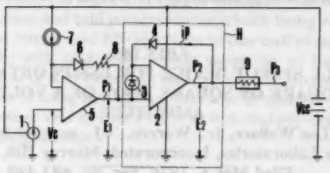
Claims priority, application Japan, June 6, 1974, 49-64384

Int. Cl.² H01V *3/00;* **H03F** *1/32*

U.S. Cl. 307—310 **6 Claims**

1. In a temperature compensating device wherein a semiconductor circuit has a signal input terminal and a bias terminal and wherein a signal output terminal, a signal source is connected to the signal input terminal and a bias voltage is impressed on said bias terminal and wherein said circuit includes a first temperature responsive semiconductor diode for adjusting an input signal from said signal source to a varying degree of adjustment according to the variation of temperature, wherein said temperature compensating device also includes a temperature compensating circuit which comprises a second temperature responsive semiconductor diode which lowers voltage as temperature varies and an output terminal

which is connected to the bias terminal of said semiconductor circuit in such a manner that the voltage reduction by said second temperature responsive diode serves to minimize the variation of the output signal from the signal output terminal of said semiconductor circuit due to temperature variation, an improvement comprising:



an electric current source for feeding said second temperature responsive semiconductor diode with an electric current i_c which corresponds to the difference in operating characteristics between said first temperature responsive diode and said second diode and which is based on the following formula:

$$i_c = \epsilon \exp\left\{\ln i_{\mu M} + \frac{T_o}{T_1 - T_o} \ln \frac{i_{op}(T_o)}{i_{oc}(T_o)} + \frac{T_1}{T_1 - T_o} \ln \frac{i_{oc}(T_1)}{i_{op}(T_1)}\right\}$$

wherein

$i_{\mu M}$: quantity of current corresponding to the mean value of the input signal from said signal source

T_o : ambient temperature of said semiconductor circuit

T_1 : same as T_o except that $T_1 > T_o$, and

$i_{oc}(T_o)$: the reverse saturation current of said second temperature responsive semiconductor diode at temperature T_o

$i_{op}(T_o)$: the reverse saturation current of said first temperature responsive semiconductor diode at temperature T_o.

4,015,150

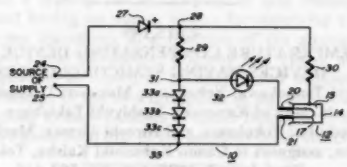
NORMALLY ON LED COULOMETRIC TIMING SYSTEM

John Paul Jones, Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 13, 1976, Ser. No. 658,092

Int. Cl.² H03K 3/42; G01R 27/22

U.S. Cl. 307—311 **6 Claims**



1. A coulometric timing system comprising

a DC source of supply,

a coulometric cell having a cathode electrode and an elongated erodable anode filament coupled between two anode terminals and disposed in an electrolyte solution, the resistance between said anode terminals being substantially low at the time said filament initially opens due to electrolytic erosion whereby said resistance increases with time,

coulometric timing circuit means coupled to said cathode electrode, an anode terminal and said source of supply for providing current flow for said electrolytic erosion of said filament,

a light emitting diode indicator coupled in series circuit with said filament,

constant voltage clamping diode means coupled in parallel circuit with said series circuit and also coupled in parallel circuit with said DC source for providing a substantially constant voltage thereacross only when said diode means conducts, said constant voltage diode means being (1) normally non-conductive with said filament unbroken and said light emitting diode conducting and illuminating and (2) conductive and providing a substantially constant voltage with said filament open initially and thereafter for extinguishing said light emitting diode.

4,015,151

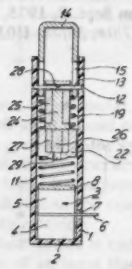
PIEZOELECTRIC IGNITER WITH A STRIKING MECHANISM

Hans-Dieter Klauer, Wehrheim, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 469,762, May 14, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,068

Int. Cl.² H01L 41/04

U.S. Cl. 310—8.7 **5 Claims**



1. A piezoelectric igniter with a striking mechanism, more especially for lighters, having a piezoelectric transducer, a hammer which is movable in the direction of the latter and which co-operates with a compression spring, a movement release device for said hammer, and a housing which receives these parts and adjacent the closed front end of which the piezoelectric transducer is arranged, wherein a bounce plate is mounted at the side face of the piezoelectric transducer facing said hammer, wherein said hammer and said bounce plate form magnetically conductive parts, and wherein at least one of these parts is provided with a permanent magnet.

4,015,152

IMPACT MECHANISM FOR PIEZOELECTRIC TRANSDUCERS

Walter Mohr, Frankfurt, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

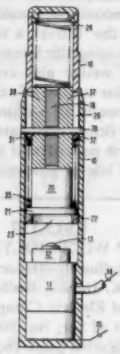
Continuation-in-part of Ser. No. 496,588, Aug. 12, 1974, Pat. No. 3,936,678. This application Dec. 1, 1975, Ser. No. 636,626

Int. Cl.² H01L 41/04

U.S. Cl. 310—8.7 **5 Claims**

1. An impact mechanism for piezoelectric transducers for use in lighters, including an outer housing accommodating said transducer, a support frame member slidably arranged within said housing and extending therefrom for manual actuation, said member incorporating a return spring, an actuating spring, a permanent magnet, and a striking hammer in magnetically retentive relationship, slots in said frame member accommodating a pin transverse to said housing and affixed thereto, said pin passing through a bore in said magnet,

whereby upon inward movement of said member within said housing, said spring is compressed by said member, causing



said hammer to overcome the retentive force of said magnet and impact upon said transducer.

4,015,153

SMALL SYNCHRONOUS MOTOR WITH LASH COUPLING

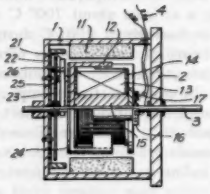
Sentaro Furuno, 22-16, Kami-Igusa, 2-chome, Suginami, Tokyo, Japan

Continuation-in-part of Ser. No. 531,347, Dec. 10, 1974, abandoned, which is a continuation of Ser. No. 361,627, May 18, 1973, abandoned. This application June 19, 1975, Ser. No. 588,462

Claims priority, application Japan, May 29, 1972, 47-53110

Int. Cl.² H02K *7/10*

U.S. Cl. 310—41 **1 Claim**



1. A small synchronous motor comprising:

a. a housing;

b. a stator having a stator magnet;

c. an output shaft;

d. a rotor rotatably mounted on the output shaft in a manner whereby the rotor is rotatable through a predetermined angle around and relative to the output shaft; and

e. a torque transmitting mechanism for transmitting torque from the rotor to the output shaft,

the synchronous motor being started upon application of electric power thereto, first, by a rotation of the rotor to its synchronous speed under no load, and, then, a rotation of the output shaft by the torque thus transmitted from the rotor by said torque transmitting mechanism, said stator being rotatably mounted on said housing with a predetermined angle around said output shaft, said stator having an engaging member which can engage with another engaging member of the rotor directly after the start of the rotor.

4,015,154

MOTOR AND METHOD FOR MAKING SAME

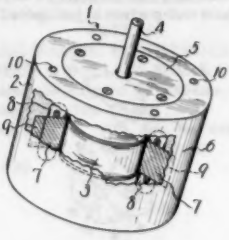
Sadao Tanaka, Machida; Kiyosi Endo, and Fumio Karakawa, both of Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 535,794, Dec. 23, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,337

Claims priority, application Japan, July 3, 1975, 70-4188

Int. Cl.² H02K *5/02, 15/02*

U.S. Cl. 310—42 **4 Claims**



1. A method for making a stator structure for a motor, said method comprising the steps of:

A. providing a stack of first ferromagnetically soft rings, each of said rings comprising an innerconnecting ring portion and a plurality of teeth portions extending outwardly from the respective interconnecting ring portion;

B. disposing a plurality of coils around said teeth portions;

C. providing a stack of second ferromagnetically soft rings;

D. inserting said stack of first rings with said coils disposed around said teeth portions into said stack of second rings;

E. molding the combined stacks of first and second rings with a dimensionally stable resin mixture of thermosetting resin and thermoplastic resin to hold said first and second rings rigidly together to form a motor casing structure entirely enclosing said rings and said coils and comprising a recess coaxial with said rings and extending inwardly from one end of said casing structure to permit a rotor to be inserted therein, said casing structure comprising an integrally molded section at the other end thereof having a first concave portion formed therein coaxial with said recess to hold bearing means to provide a first accurately placed receptacle for supporting one end of the rotor;

F. molding a bracket of said dimensionally stable resin mixture to attach to said one end of said casing structure to close said recess, said bracket being molded to have a second concave portion to provide a second accurately placed bearing receptacle for supporting the other end of the rotor; and

G. assembling said bracket and said casing structure together such that said first and second concave portions are aligned to support said rotor.

4,015,155

COVER AND BASE ARRANGEMENT FOR AN ELECTRICAL MACHINE

Karl Lang, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 19, 1975, Ser. No. 578,803

Claims priority, application Germany, June 6, 1974, 2427427

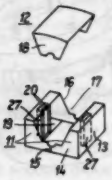
Int. Cl.² H02K *5/00*

U.S. Cl. 310—89 **10 Claims**

1. In an electric machine equipped with cable terminals and served by supply lines having a stator 6 including a stator lamination stack 7, a winding 7*a* supported on said stack, shield-like pressure plates 5 overlapping the stack at respective ends of said stack, and means for holding the stack together; a rotor having a rotor shaft and bearings; and a base and cover arrangement for supporting and protecting said machine, the improvement comprising:

a base structure 1 for supporting said stator and said rotor bearings including a frame 2 made of a hollow section, transverse walls 3 enclosed in said frame, said walls extending perpendicular to the direction of the longitudinal axis of said rotor and having a profile corresponding to the shape of said pressure plates;

a cover including two side members 11 seated on said frame and a central upper cap 12, said side members each having a mid-portion 13 forming a side wall of said machine and configured to recieve said cable terminals and said supply lines, and end-portions 14 disposed at respective sides of said mid-portion in juxtaposed relationship to



adjacent end-portions of said side members so as to form end-face walls of said machine, each two of said juxtaposed end-portions conjointly defining a vertical interface 15 in line with the center line of said rotor shaft and having a composite contour defining an upwardly opening cut-out 17 encompassing said shaft for lifting said stator and said rotor upwardly together, said upper cap having end-face extensions 18 covering corresponding ones of said cut-outs; and

elastic sealing means, disposed at the interface of and between said central upper cap and said side members, and having a sound attenuation capability corresponding to the wall thickness of said cover.

4,015,156

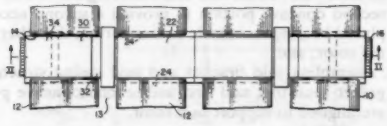
DYNAMOELECTRIC MACHINE LOCKING WEDGE FOR COIL RETENTION

Paul S. Johrde, Franklin Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1975, Ser. No. 589,975

Int. Cl.² H02K *3/48*

U.S. Cl. 310—214 **4 Claims**



1. A dynamoelectric machine comprising:

a core including a plurality of spaced packs of metallic laminations;

a slot in said core;

a coil in said slot;

means for securing said coil in said slot including a flexible insulating tape on said coil, a slot filler of insulating material disposed on said tape, a first slot wedge over said slot filler and engaged within lateral grooves in a first of said plurality of spaced packs of metallic laminations that is in the interior of said core, said first pack being adjacent a second of said plurality of packs that is on the exterior of said core, a two-part locking slot wedge disposed over said slot filler and said tape in the slot of said second pack, said tape being folded back on said filler and continuing along said filler with an extremity of said tape extending between said first slot wedge and said locking slot wedge;

said locking slot wedge comprising a first part of a generally T configuration with the top of the T in the space between said first and second packs and the bottom of the T within said slot of said second pack, said first part being tapered from the top of the T over a substantial portion of its length with decreasing thickness to the bottom of the T, said locking slot wedge also comprising a second part with a taper similar to that of said first part, said second part being frictionally fit within lateral grooves in said second pack and fitting over said tapered portion of said first part, said first part of said locking slot wedge being spaced from said lateral grooves.

4,015,157

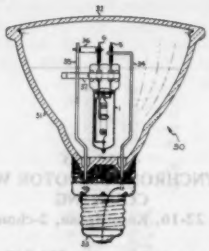
IODINE LAMP WITH MOLYBDENUM PARTS

Robert S. Roller, Lyndhurst; Richard H. Holcomb, Chagrin Falls, and George K. Danko, Bedford Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 507,672, Sept. 20, 1974, abandoned. This application June 16, 1975, Ser. No. 586,883

Int. Cl.² H01K *1/20, 1/40, 1/50*

U.S. Cl. 313—25 **10 Claims**



1. A halogen regenerative cycle incandescent lamp comprising a compact envelope of light-transmitting material of high softening temperature, inleads including inner portions of molybdenum sealed into said envelope, an incandescible tungsten filament coil connected across said inner portions, the distance from the filament to the envelope wall being small enough that the inner wall temperature immediately surrounding the filament is at least about 700° C and the low point temperature is at least about 250° C during operation, said inner portions being of molybdenum wire which has been treated to increase its ductility to a minimum elongation of 15% and reduce the concentration of impurities at the surface, and a fill gas comprising nitrogen, an inert gas and an iodine-providing component at a total minimum pressure of 2000 torr, said component providing from 3.1×10^{-7} to 9.6×10^{-7} gram atoms of iodine per cubic centimeter of envelope volume.

4,015,158

BROMINE LAMP WITH MOLYBDENUM PARTS

Robert S. Roller, Lyndhurst; Richard H. Holcomb, Chagrin Falls, and George K. Danko, Bedford Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

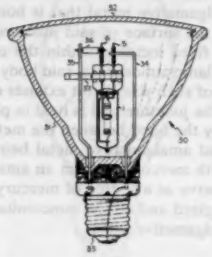
Continuation-in-part of Ser. No. 502,142, Aug. 30, 1974, abandoned. This application June 16, 1975, Ser. No. 586,884

Int. Cl.² H01K *1/20, 1/40, 1/50*

U.S. Cl. 313—25 **10 Claims**

1. A bromine regenerative cycle incandescent lamp comprising an envelope of light-transmitting material of high softening temperature, inleads including inner portions of molybdenum sealed into said envelope, an incandescible tungsten filament coil connected across said inner portions, the distance from the filament to the envelope wall being small enough that the inner wall temperature immediately surrounding the filament is at least about 700° C and the low point

temperature at the ends of the envelope is at least about 350° C during operation, said inner portions being of molybdenum wire which has been treated to increase its ductility to a minimum elongation of 15% and reduce the concentration of



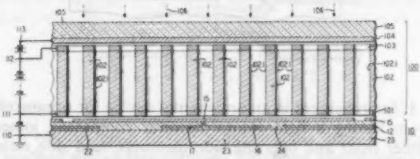
impurities at the surface, and a fill gas comprising nitrogen, an inert gas and a bromine-providing component at a total minimum pressure of 2000 torr, said component providing from 1.6×10^{-9} to 8.0×10^{-8} gram atoms of bromine per cubic centimeter of envelope volume.

4,015,159

SEMICONDUCTOR INTEGRATED CIRCUIT TRANSISTOR DETECTOR ARRAY FOR CHANNEL ELECTRON MULTIPLIER

George Gustave Zipfel, Jr., Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 15, 1975, Ser. No. 613,218
Int. Cl.² H01J *39/14, 43/22;* **H01L** *29/78*
U.S. Cl. 313—95 **10 Claims**



1. Semiconductor apparatus which comprises

a. a semiconductor wafer of essentially one type relatively low electrical conductivity including an array of essentially mutually parallel relatively high conductivity elongated common bus strip regions of opposite type conductivity in said wafer, each of said bus regions being bounded on one side by a major surface of the semiconductor wafer;

b. an insulating layer coating said major surface of the semiconductor wafer;

c. an array of metal plates located on an exposed surface of the insulating layer for collecting electrons incident on said plates;

d. electrically conductive means for connecting each metal plate through a different aperture in the insulating layer to a different localized surface zone in a first array of localized surface zones in said wafer, said localized zones of opposite type conductivity to said one type in said wafer, each said zone being isolated from all the strip regions;

e. a second array of localized surface zones of said opposite type conductivity in said wafer, each said zone in the second array being isolated from all the strip regions and from all the zones in the first array, each zone in the second array located proximate to a corresponding zone in the first array, each zone of the second array being connected to an output bus electrode through a different aperture in the insulating layer; and

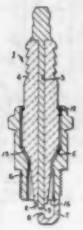
f. dual electrode gating means located in said insulating layer for controlling the surface conductivity of the semiconductor wafer between each localized zone of the first array and its said corresponding proximate localized zone in the second array, one of said electrode means being connected to one of the common bus regions through an aperture in the insulating layer and the other of said electrode means being elongated to form a common bus electrode essentially orthogonal to the common bus regions.

4,015,160

SPARK PLUG HAVING ELECTRODES SHAPED TO PRODUCE A HOLLOW SPARK COLUMN

Jose Hector Lara, and Edward B. Williams, Jr., both of P.O. Box 876, Greenville, Tex. 75401

Filed Jan. 14, 1976, Ser. No. 649,094
Int. Cl.² H01T *13/20*
U.S. Cl. 313—139 **8 Claims**



8. A spark plug for internal combustion engines and comprising:

a. a metal shell having a central passage therethrough;

b. an insulator member positioned in said central passage;

c. an elongated first electrode in said insulator member and having one end portion thereof spaced from an end of said insulator member;

d. a second electrode extending from said metal shell and having one end portion thereof in spaced and facing relation with said one end portion of said first electrode; and

e. means on said end portions of said first and second electrodes defining respective facing ridges each in the form of a closed geometric figure thereby defining a spark discharging portion on said first electrode and a spark landing portion on said second electrode whereby said spark discharging portion and said spark landing portion cooperate to provide a spark in the form of a hollow column in the shape of the geometric figure, said means defining said spark discharging portion including means on the one end portion of said first electrode defining a recess within said ridge on the one end portion of said first electrode, said means defining said spark landing portion including means on the one end portion of said second electrode defining a recess within said ridge on the one end portion of said second electrode, said ridges on said end portions of said first and second electrodes being of corresponding size and shape whereby the spark is in the form of a hollow column having a substantially identical cross section for the length thereof.

4,015,161

ANTI-POLLUTION SPARK PLUG

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,297
Int. Cl.² H01T *13/20*
U.S. Cl. 313—143 **2 Claims**

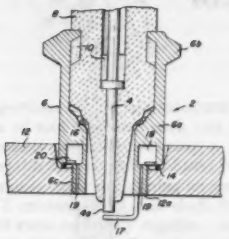
1. A spark plug adapted to reduce the oxides of nitrogen

contained in the combustion products of an internal combustion engine, said oxides of nitrogen having an excess concentration relative to an equilibrium value defined by the pressure, temperature and composition parameters of said products of combustion, comprising

a. a tubular metal shell having a body portion, a non-circular enlarged portion at one end of said body portion, and an externally threaded portion of reduced diameter at the other end of said body portion, said reduced externally threaded opening contained in the head of an internal combustion engine;

b. a center electrode extending coaxially in spaced relation through said shell;

c. a tubular ceramic insulator arranged concentrically between said center electrode and said shell for supporting said electrode in said shell, said center electrode porjecting at one end beyond said insulator adjacent the reduced end of said shell; and



d. a ground electrode connected with said shell and extending in spaced relation adjacent said projecting center electrode end, thereby to establish a spark in a cylinder of the engine when said shell is threadably connected in the head opening;

e. said shell body portion containing a closed continuous annular storage chamber arranged concentrically about the longitudinal axis of said shell, and said reduced portion containing at least one longitudinal passage communicating at one end with said storage chamber, the other end of said passage terminating in an orifice contained in the free end surface of said reduced portion, whereby unburned hydrocarbons stored in said storage chamber during the compression stroke of the engine are returned to the cylinder during the expansion stroke following combustion, thereby to reduce the oxides of nitrogen to the equilibrium value.

4,015,162

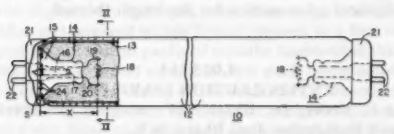
FLUORESCENT LAMP HAVING IMPLANTED AMALGAMATIVE METAL FOR MERCURY VAPOR REGULATION

George S. Evans, Caldwell, and Henry Skwirut, Verona, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 7, 1975, Ser. No. 593,814

Int. Cl.² H01J *61/24*

U.S. Cl. 313—490 **14 Claims**



1. In combination with an electric discharge lamp having an envelope that contains spaced electrodes and an ionizable medium which includes mercury, integral means for regulting the mercury vapor pressure within the envelope during the operation of said lamp comprising;

a member that is secured to a portion of said envelope by a juncture which comprises a part of the interior structure of the lamp, and

a body of amalgamative metal that is bonded to and protrudes from the surface of said juncture and is thus anchored at a fixed location within the envelope and exposed to the lamp atmosphere, said body of amalgamative metal being of such size that it extends over only a small segment of the juncture and is held in place on the juncture solely by the bond between the metal and said juncture, and said amalgamative metal being of a type that combines with mercury to form an amalgam and is thus adapted to serve as a source of mercury vapor when the lamp is energized and effects concomitant heating of the body of amalgamative metal.

4,015,163

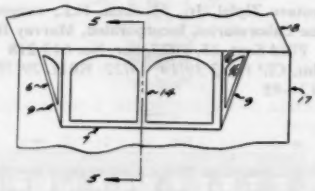
ORNAMENTAL DEVICE

Michael D. Iacobelli, 565 Morse Road, Apt. 104, Troy, Mich. 48084

Filed June 12, 1975, Ser. No. 586,250

Int. Cl.² A47B *77/08*

U.S. Cl. 312—223 **4 Claims**



1. Improvement in an ornamental device for ornamenting a room having a light source therefor comprising joined together front and opposite side members, said side members projecting rearwardly from the rear face of said front member and means for attaching said device to a corner of said room formed by the junction of a wall and a ceiling thereof so that said device covers said light source and one edge of said front and side members presses against said ceiling and another edge thereof presses against said wall, said attaching means being yieldable means arranged to pull upon said rear face so as to pull said device inwardly toward said corner, said device having at least one translucent panel therein for passing light from said source therethrough from inside said device to the outside thereof, whereby to decoratively affect the illumination of said room.

4,015,164

METALLIC HALIDE HIGH-PRESSURE GAS DISCHARGE LAMP

Ernst Fischer, Stolberg; Roland Lorenz, and Ludwig Rehder, both of Aachen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,536

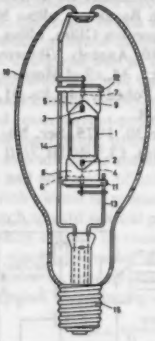
Claims priority, application Germany, Nov. 30, 1974, 2456757

Int. Cl.² H01J *17/20*

U.S. Cl. 313—223 **9 Claims**

1. A metallic halide high-pressure gas discharge lamp having a hermetically closed, radiation transmissive discharge

vessel, having two electrodes arranged therein between which the discharge takes place and a filling comprising at least one



metallic halide and a buffer substance, and during operation of the lamp the filling contains elementary arsenic.

4,015,165

ELECTRIC LAMP WITH MOLYBDENUM CONTACT PINS SURROUNDED BY NON-CORROSIVE METAL SLEEVES

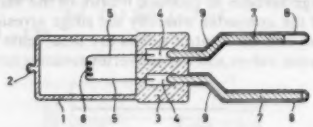
Alfons Eugeen Maria Hardies, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,078

Claims priority, application Netherlands, Apr. 2, 1975, 7501272

Int. Cl.² H01J *5/46, 61/36;* **H01K** *1/40*

U.S. Cl. 313—318 **4 Claims**



1. An electric lamp having a quartz glass lamp envelope with pinched seal, a molybdenum foil being incorporated in the pinch to which foil are connected an inner current conductor and a contact pin which comprises an outer current conductor of molybdenum, a sleeve disposed about part of the outer current conductor projecting beyond the lamp envelope, said sleeve being a corrosion-resistant metal, said current conductor and said sleeve each having a cooperatively dimensioned and configured kink preventing relative movement therebetween.

4,015,166

X-Y MATRIX TYPE ELECTROLUMINESCENT DISPLAY PANEL

Nobumasa Ohshima; Hiroshi Kawarada, both of Hirakata; Shinichi Noma, Katono, and Toshio Tatsumichi, Ando, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 394,860, Sept. 6, 1973, abandoned. This application May 4, 1976, Ser. No. 683,215

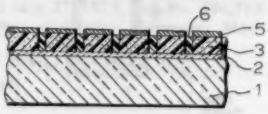
Claims priority, application Japan, Sept. 6, 1972, 47-89747; Oct. 20, 1972, 47-105432

Int. Cl.² H05B *33/02, 33/14, 33/22*

U.S. Cl. 313—503 **6 Claims**

1. An X-Y matrix type electroluminescent display panel comprising:

a transparent insulating substrate; flat transparent and parallel strip-shaped X-electrodes on said transparent insulating substrate; a formed D.C. electroluminescent layer on said flat transparent parallel electrodes; parallel strip-shaped Y-electrodes on said D.C. electroluminescent layer, the direction of said Y-electrodes being perpendicular to that of said X-electrodes, said X- and Y-electrodes and said D.C. electroluminescent layer defining display elements at the crossing points of said X- and Y-electrodes; and a mesh-shaped insulating layer within said



D.C. electroluminescent layer and mounted on said X-electrodes and extending at least part way through the thickness of said D.C. electroluminescent layer for insulating said display elements from each other at least in the vicinity of said X-electrodes, said insulating layer being a photo-resist material.

4,015,167

CIRCUITS FOR OPERATING ELECTRIC DISCHARGE LAMPS

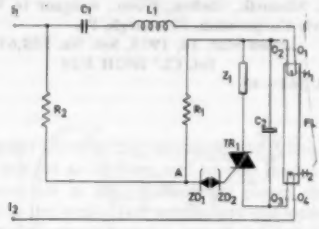
Philip Rufus Samuels, London, England, assignor to The General Electric Company Limited, London, England

Filed June 25, 1975, Ser. No. 590,296

Claims priority, application United Kingdom, July 2, 1974, 29290/74

Int. Cl.² H05B *41/23*

U.S. Cl. 315—99 **9 Claims**



1. A circuit for operating an electric discharge lamp comprising: a pair of input terminals for connection to an alternating current supply; a pair of output terminals for connection with the discharge lamp; and circuit means connected between said input terminals and said output terminals for controlling the supply of current to a lamp connected with the output terminals from a supply connected to said input terminals, said circuit means including means for changing the mode of operation of the circuit in response to a change in the phase of the voltage applied to the lamp relative to the phase of the voltage of the supply.

4,015,168

CURRENT LIMITING DEVICE FOR AN ELECTRICAL NETWORK

Ernst Massar, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 30, 1975, Ser. No. 600,372

Claims priority, application Germany, July 31, 1974, 2436929

Int. Cl.² H02H *3/00*

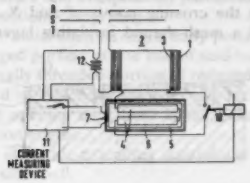
U.S. Cl. 361—19 **8 Claims**

1. A current limiting device for electrical network comprising:

a. a superconductor coupled to the network;

b. a winding through which the network current flows;

c. magnetically conducting shielding means shielding said superconductor from the magnetic field produced by said winding; and



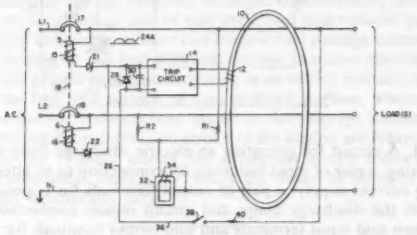
d. means for transversely magnetizing said shielding means up to the point of saturation.

4,015,169

TWO POLE GROUND FAULT CIRCUIT INTERRUPTER WITH IMPROVED RECTIFIED SUPPLY AND TRANSIENT SUPPRESSION FOR A TRIP CIRCUIT

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1975, Ser. No. 558,617
Int. Cl.² H02H *3/28*
U.S. Cl. 361—45 **3 Claims**



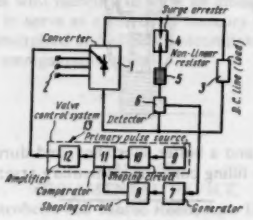
1. A two pole ground fault circuit interrupter comprising: a differential transformer core, a plurality of primary windings on said core, said plurality of primary windings including at least two line conductors and a neutral conductor of an AC electrical distribution system; a secondary sensing winding on said core for sensing current unbalance between said primary windings; means responsive to a predetermined sensed signal to open said line conductors and comprising a trip circuit having two terminals connected across said sensing winding, said means also comprising circuit breaker contacts and associated solenoids for each of said line conductors, each solenoid having a respective trip coil having one end connected to one of said line conductors, each of said coils having another end connected respectively to first and second like poled zener diodes, said first and second zener diodes having a common connection remote from said trip coils, said common connection being conductively connected to a third terminal of said trip circuit; a conductive circuit branch connecting a fourth terminal of said trip circuit to said neutral conductor, and a third zener diode connected between said conductive circuit branch and said common connection.

4,015,170

METHOD FOR OVERVOLTAGE PROTECTION OF HVDC TRANSMISSION LINE SYSTEMS

Khristofor Fedorovich Barakaev, ulitsa Molostovykh, 19, kv. 344; Alexandr Sergeevich Gilim, ulitsa Miklukho-Maklaya, 65, korpus 2, kv. 40; Anatoly Viktorovich Stukachev, Festivalnaya ulitsa, 7, kv. 34, all of Moscow, and Robert Nikolaevich Shulga, ulitsa Pobedy, 14a, kv. 41, Reutov Moskovskoi oblasti, all of U.S.S.R.

Filed June 30, 1975, Ser. No. 592,071
Int. Cl.² H02H *7/10*
U.S. Cl. 361—91 **3 Claims**



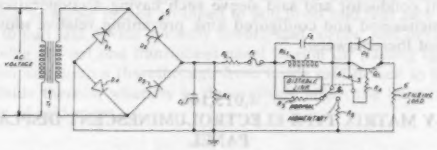
1. A method for overvoltage protection of an HVDC transmission line system in which AC is supplied to the valves of a converter and a surge arrestor and resistor are connected on the DC side of the converter, said method comprising supplying control pulses to the valves of the converter for operation thereof, detecting the presence of overvoltage in the converter by actuation of the surge arrester, blocking passage of a control pulse to a valve of the converter in response to actuation of the surge arrestor to produce misfire of the valve and zero output of the converter whereby the surge arrestor becomes deactuated and the control pulses are then again supplied to the converter valves and the converter resumes normal operation.

4,015,171

RESETTABLE OVERCURRENT-PROTECTED DIRECT CURRENT POWER SUPPLY

Dale Lloyd Miller, Harrisburg, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 6, 1976, Ser. No. 655,808
Int. Cl.² H02H *7/00*
U.S. Cl. 361—18 **22 Claims**



1. A resettable overcurrent-protected direct current power supply comprising:

a source of direct current voltage;

a utilizing load;

a bistable magnetic switch circuit having one terminal coupled to said source of direct current voltage, a contact coupled to the other terminal of said bistable switch circuit and an armature controlled by said bistable switch circuit to make and break contact with said contact, said bistable switch circuit being energized at a given tripped current;

a transistor having its collector coupled to said other terminal of said bistable switch circuit, its emitter coupled to said load and its base coupled to said armature remote from said contact; and

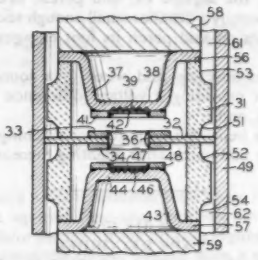
a reset switch coupled to said other terminal of said bistable switch circuit having a normal position to complete a portion of said bistable switch circuit and a momentary contact position, said reset switch being actuated to said momentary contact position after said bistable switch circuit has been energized due to an overcurrent condition to place said armature and said contact in a break state to render said transistor non-conductive and providing the desired overcurrent-protection, said bistable switch circuit de-energizing prior to actuation of said reset switch but said armature and said contact remaining in a break state and actuation of said reset switch causes said bistable switch circuit to re-energize, and the return of said reset switch to said normal position de-energizing said bistable switch circuit to cause said armature and said contact to assume a make state and render said transistor conductive to prepare said bistable switch circuit to protect against a continuing or a new overcurrent condition.

4,015,172

TWO PATH VOLTAGE ARRESTER

Gerhard Peche, and Gerhard Lange, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,224
Int. Cl.² H01J 17/04
U.S. Cl. 361—129 **3 Claims**



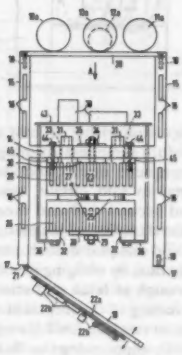
1. An over voltage arrester comprising:
an insulating tubular member,
a pair of main electrodes mounted and sealed to opposite ends of said insulating tubular member,
a central electrode attached to said tubular insulating member between said main electrodes and with a central opening and forming two discharge paths therewith,
four metallic rings with two of said rings attached to the facing surfaces of said pair of main electrodes and two other of said rings attached to opposite sides of said central electrode about said central opening,
activation material mounted on said main electrodes within said two rings and activation material also mounted on the inside of said central openings of said central electrode and said other two rings, and
wherein said tubular insulator member mounted in said tubular frame member and formed with a pair of ring-shaped shoulders and positioned at the centers of said planar portions of said main electrodes so that protrusions exceeding the outer diameters of said main electrodes are formed in the center part of said insulator member and insulating gaps are formed between said shoulders and said tubular frame.

4,015,173

SUPPORT FOR MOUNTING THE ELECTRONIC COMPONENTS OF A SINGLE PHASE UNIT FOR AN INVERTER

Herbert Nitsche, Spardorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 27, 1975, Ser. No. 580,773
Claims priority, application Germany, May 29, 1974, 2426229
Int. Cl.² H05K 7/20
U.S. Cl. 361—388 **10 Claims**

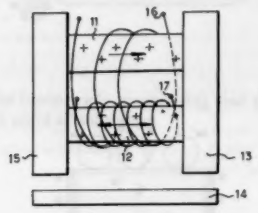


1. In a support for mounting electronic components of a single phase unit for an inverter, said support having an H-shaped cross-section in all cross-sectional planes disposed perpendicular to the longitudinal axis thereof and including a planar center plate member and a pair of planar end plate members coupled to the center plate member and disposed in spaced-apart parallel relationship transversely with respect to the plane of said center plate member, said electronic components being mounted on at least one of the planar surfaces of said center plate member and said end plate members extending transversely with respect to the plane of said center plate member beyond said electronic components mounted thereon, the improvement comprising,
cover plate members, fastened to the ends of said end plate members and disposed parallel to said center plate member, the surfaces of said cover plate members facing away from said center plate member providing a mounting surface for additional electronic components, said cover plate members having a width which is less than that of said support;
electronic control means for said electronic components mounted on one of said cover plate members, said components being mounted on the surface of said center plate member which faces said one of said cover plate members and comprising thyristor and diode assemblies and including electrically conductive heat sinks;
circuit protection means, mounted on the other surface of said center plate member; and
a commutation choke, a current limiting choke, and a commutation capacitor mounted on the surface of said other of said cover plate members facing said center plate member.

4,015,174
DEVICES FOR MAGNETIC CONTROL WITH PERMANENT MAGNETS

Michel Cotton de Bennetot, Brest, France, assignor to Le Materiel Magnetique, France

Filed July 30, 1975, Ser. No. 600,238
Claims priority, application France, July 30, 1974, 74.26380
Int. Cl.² H01H 47/32
U.S. Cl. 361—153 4 Claims

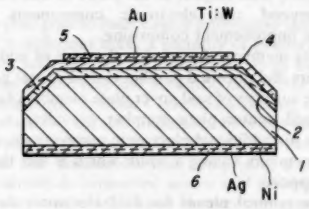


1. Magnetic device comprising at least one pair of permanent magnets, armature members forming with at least said one pair a closed magnetic circuit and also defining at least one air gap external to said circuit, said magnetic device comprising first and second coil and means energizing said coils for inverting the direction of magnetisation of one of the magnets of at least said one pair in such a manner as to modify the path of magnetic flux, by obliging it in one case to re-close itself by passing through at least said one air gap and in the other case, after inverting of the direction of magnetisation of one of the magnets, to re-close itself through the said magnet and partially or wholly suppressing the flux in the region of at least said one air gap, wherein only the first coil is energized for establishing the magnetic flux in the region of at least said one air gap, and only the second coil is energized for obtaining the partial or total suppression of the said flux, the direction of flow of current being constant in each of the coils.

4,015,175
DISCRETE, FIXED-VALUE CAPACITOR

Don L. Kendall, Pueblo, Mexico; Byron T. Ahlburn, Dallas, and Klaus C. Wiemer, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 2, 1975, Ser. No. 582,951
Int. Cl.² H01G 1/01
U.S. Cl. 361—313 5 Claims

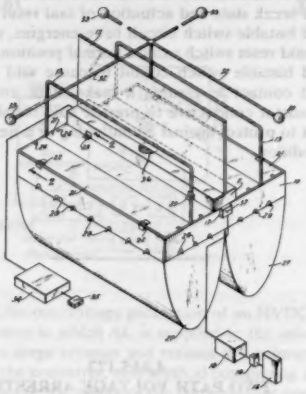


5. A semiconductor capacitor chip comprising a monocrystalline silicon body doped to a concentration in excess of 10^{19} atoms per cm^3 and having first and second substantially parallel opposite faces, a first dielectric layer of thermally grown silicon oxide about 300–600 angstroms thick on said first face, a second dielectric layer on said oxide comprising silicon nitride about 200–600 angstroms thick, a first metal film comprising Ti:W on said nitride layer, a gold-comprising film on said Ti:W, and a metal contact comprising silver-coated nickel on said second face.

4,015,176
APPARATUS FOR REMOVING BIRDS AND OTHER PESTS

Francis V. Shanahan, Valley Stream, and Herman H. Feller, Brooklyn, both of N.Y., assignors to Shock-M-All, Inc., Valley Stream, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,802
Int. Cl.² H05C 1/00
U.S. Cl. 361—232 13 Claims



1. Apparatus for removing birds from a selected environment, comprising:

a narrow elongated perch of non-electrically-conductive material,

a pair of electrically-conductive wires carried by, and exposed on the surface of, said perch, said wires being spaced apart by a distance small enough such that when a bird alights on said perch its foot engages both of said wires,

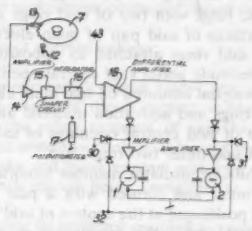
means for connecting said wires to a source of electric power for providing a voltage difference between said two wires, and

a receptacle beneath said perch for catching a bird which falls from said perch after alighting thereon.

4,015,177
TAPE RECORDER

Filinto Vaz Martins, rue Coulon 2, 2000 Neuchatel, Switzerland

Filed Feb. 15, 1974, Ser. No. 442,787
Claims priority, application Switzerland, Feb. 23, 1973, 2627/73
Int. Cl.² G05B 11/06
U.S. Cl. 318—7 7 Claims



1. A tape recorder comprising, two hubs for driving two tape spools to pass a tape from one spool to the other along a

given path, two individual reversible motors for driving respective ones of said hubs, a tachometer wheel disposed so as to be driven by a tape passing along said given path at a speed proportional to the speed of the tape along said given path, means cooperative with said tachometer wheel for providing an electrical signal representing the speed of rotation of the tachometer wheel, direction-detecting means for detecting the direction of advance of the tape and for developing a tape direction signal representative of the direction of advance, and an electronic control circuit, said electronic control circuit including means for comparing said signal with a reference value and for providing to said motors control signals having current values dependent upon the voltage values thereof and the impedance of said motors, said voltage values being proportional to the difference value between said electrical signal and said reference value for differentially controlling the speeds of the two motors to maintain the speed of the tape along said given path at a constant value.

4,015,178

REFERENCE VALUE TRANSMITTER FOR A PHASE CLIPPING CONTROL FOR STARTING A SQUIRREL CAGE-ASYNCHRONOUS MOTOR

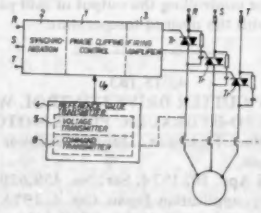
Charles Phillot, Aarau, and Heinz Unterweger, Buchs, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed June 20, 1975, Ser. No. 588,958

Claims priority, application Switzerland, June 27, 1974, 8854/74

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **7 Claims**



1. A reference value transmitter for a phase clipping control for starting a squirrel cage-asynchronous motor comprising start-up regulator means for the upward regulation of a reference value transmitter-output voltage from a start-up voltage value which is constant during a primary start-up phase to a rated voltage value having a predetermined build-up speed during a terminal start-up phase, a command transmitter for delivering a command signal to the start-up regulator means, an adjustment mechanism for adjusting a reference voltage value which deviates from the start-up voltage value, a regulation device triggered upon switching-on the reference value transmitter for leading the reference voltage from the starting voltage value to the start-up voltage value during a start-up starting phase with predetermined lead speed and which start-up starting phase precedes the primary start-up phase, said start-up regulator means containing means for triggering the terminal start-up phase by the command signal, said command transmitter incorporating a current measuring device for the motor current and a threshold value indicator connected with the current measuring device for generating the command signal, said current measuring device including a current voltage converter equipped with rectifier means, said threshold value indicator including a voltage comparator having a first input and a second input; means for applying a measurement voltage to the first input of the voltage comparator, and a circuit arrangement connected with the second input of the voltage comparator for applying thereto a comparison voltage determining the threshold value, and wherein by means of the threshold value of the threshold value indicator there is detected the intensity of the motor current intensity amounts to a predetermined fraction of the motor current intensity at the start of the primary start-up phase.

4,015,179

DC MOTOR CONTROL CIRCUIT

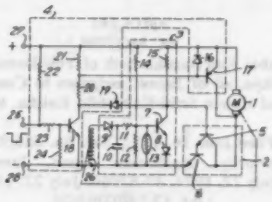
Takeshi Endo, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,916

Claims priority, application Japan, Dec. 21, 1973, 48-146827[U]

Int. Cl.² H02P *1/18*

U.S. Cl. 318—275 **10 Claims**



1. A DC motor control circuit comprising a DC constant voltage source, control circuit means, a DC motor, a switching transistor means having a first switching control electrode, and two further electrodes defining a current path connected in parallel with said DC motor, said parallel connection being series connected to said DC voltage source and said control circuit means, and drive means coupled to said first switching control electrode, said drive means being adapted to produce a starting signal for opening said switching transistor means current path, and a stopping signal for closing said switching transistor means current path in response to the respective application of one of a START signal and STOP signal to said drive means, said drive means including a drive transistor having a first driving control electrode for receiving one of a START and STOP signal, and two further electrodes defining a current path, a first of said drive transistor current path electrodes being coupled to a reference potential, said other drive transistor current path electrode being coupled to said first switching control electrode to apply said starting signal and stopping signal thereto, and diode means coupled to said other drive transistor current path electrode and to said control circuit means for preventing said switching transistor means current path from closing when a START signal is applied to said first driving control electrode.

4,015,180

SPEED REGULATING DEVICES FOR ROTARY MACHINES OR THE LIKE

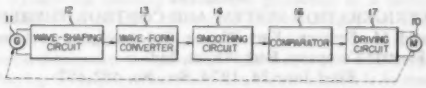
Yoshio Tetsugu, Katano; Tsunemi Mitsui, Osaka, and Hiroshi Minakuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 21, 1975, Ser. No. 551,751

Claims priority, application Japan, Mar. 8, 1974, 49-27532

Int. Cl.² H02P *5/06*

U.S. Cl. 318—314 **6 Claims**



1. A speed regulating device for rotary machines powered by a supply voltage comprising

a. means for obtaining from a rotational speed detector attached to a rotary machine a first time varying signal which is dependent upon the rotational speed of said rotary machine;

b. means for combining said first time varying signal with a reference timing signal to generate a rectangular waveform signal whose amplitude changes in response to the variation in supply voltage;

c. means for smoothing said rectangular waveform signal to derive a time varying DC voltage signal;

d. means for comparing said time varying DC voltage signal with a reference DC voltage signal derived by dividing the supply voltage; and

e. means operating in response to the output signal from said comparator means, for controlling said rotary machine to rotate at predetermined rate.

4,015,181
DC MOTOR

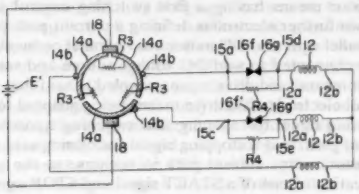
Yukuo Karube; Koji Suzuki, both of Yokohama, and Ryoichi Ezaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed June 16, 1975, Ser. No. 586,926

Claims priority, application Japan, June 18, 1974, 49-69489; July 22, 1974, 49-83960; July 22, 1974, 49-83961

Int. Cl.² H02P *5/08*

U.S. Cl. 318—325 **18 Claims**



1. A DC motor comprising:

a rotary shaft;

an armature core having a plurality of salient poles and secured to said rotary shaft;

armature windings coiled on said salient poles;

a commutator electrically connected to said windings and secured to said rotary shaft;

switch means capable of cutting off the current flow path to said windings and disposed between said salient poles of said core and operable to be opened and closed by centrifugal force in a plane containing the axis of said rotary shaft, said switch means being electrically connected in the current flow path to said windings; and

means for supporting said switch means between said salient poles of said core and disposed with respect to said windings on the same side that said commutator is disposed, said support means including means for electrically connecting said switch means in the current flow path to said windings and electrically connected to said switch means;

whereby the speed of revolution of said motor may be made constant independently of the direction of revolution.

4,015,182
REFRIGERATION SYSTEM AND CONTROL THEREFOR

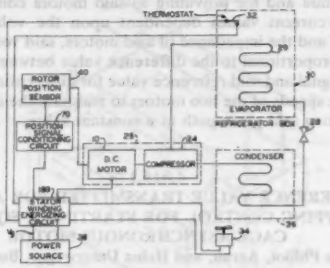
David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 24, 1974, Ser. No. 482,407

Int. Cl.² H02K *29/00*

U.S. Cl. 318—334 **10 Claims**

1. A refrigeration system comprising a compressor assembly including a compressor mechanism for circulating a refrigerant through an evaporator and a D.C. motor coupled with said compressor mechanism and comprising a stationary armature core having a longitudinal axis, at least one excitable winding disposed on said armature core to produce at least one magnetic field, and a permanent magnet rotor adapted to rotate about said longitudinal axis in response to the at least one magnetic field produced by said winding; electronic commutating means for selectively switching a source voltage to energize in sequence different portions of said winding, whereby said D.C. motor is efficiently energized; temperature



control means for providing an output indicative of the desired temperature to be maintained by said refrigeration system; and control means responsive to the temperature control means output for controlling the stator winding energization in accordance with the desired temperature; said system further including a power source controllable for providing a variable source voltage, and said control means comprising regulator means responsive to the output of said temperature control means for controlling the output of said power source in accordance with the desired temperature.

4,015,183
ROTARY CUTTER DRIVE CONTROL WITH ELECTRO-HYDRAULIC PULSE MOTOR

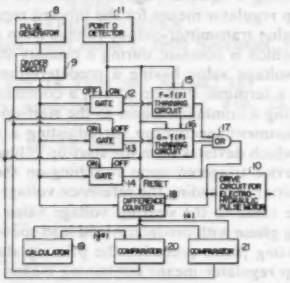
Hiroshi Miyakita, Toyonaka, Japan, assignor to Ichiro Miyakita, Japan

Filed Apr. 10, 1974, Ser. No. 459,620

Claims priority, application Japan, Oct. 4, 1973, 48-111679

Int. Cl.² G05B *19/28;* **B26D** *5/20*

U.S. Cl. 318—601 **6 Claims**



1. An apparatus for controlling the speed of a rotary cutter driven by an electro-hydraulic pulse motor for cutting to length a sheet material continuously supplied to said rotary cutter comprising:

first means for producing a first pulse train having a pulse rate in synchronism with the feed rate of said sheet material,

second means for decreasing the pulse rate of said first pulse train applied thereto thereby to produce a second pulse

train and operative selectively in a first mode where the rate of decrease of the pulse rate increased progressively according to a predetermined first pattern and in a second mode where the rate of decrease of the pulse rate decreases progressively according to a predetermined second pattern.

detecting means for producing a first signal when the blades of said rotary cutter reach a predetermined position after cutting,

comparator means for producing second and third signals when the difference between the number of pulses of said first pulse train applied to said second means and that of said second pulse train produced by said second means reaches a predetermined first value and a predetermined second value, respectively,

first gate means for causing said second means to operate in said first mode during a first period from ocurrence of said first signal to occurrence of said second signal and to operate in said second mode during a second period from occurrence of said second signal to occurrence of said third signal thereby to apply said second pulse train produced by said second means to said pulse motor during said first and second periods, and

second gate means for applying said first pulse train to said pulse motor during a third period from occurrence of said third signal to occurrence of said first signal.

4,015,184

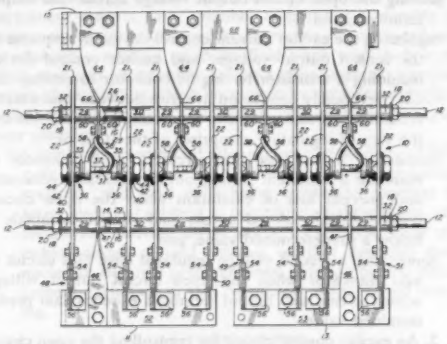
SILICON JUNCTION DIODE RECTIFIER POWER PACK

Seymour A. Cooperman, Chicago, Ill., assignor to Clinton Supply Company, Chicago, Ill.

Filed Nov. 20, 1975, Ser. No. 633,573

Int. Cl.² H02M *7/06*

U.S. Cl. 321—8 C **8 Claims**



1. In an air-cooled, full-wave silicon junction diode rectifier having long bolts with tubular insulation thereabout arranged in parallel side-by-side relation and a pack of elongated heat sink plates mounted in parallel side-by-side relation thereon over said tubular insulation, the improvement in conductor for transfer of D.C. current from the anode electrodes of the diodes to the main rectifier D.C. positive output busbar lying in the direction of elongation of said heat sink plates and bearing a perpendicular relation thereto comprising:

a. a cable operationally connected at one end to the anode electrodes of each of said diodes; and

b. twisted straps for support of said D.C. positive output busbar having bored flat portions at one end for slidingly mounting on said tubular insulation, each strap installed on one of said long bolts at locations corresponding to alternate pairs of heat sink plates, said straps extending from said pack in the direction of elongation of said heat sink plates having cross-sections in said direction lying in planes perpendicular to the planes of said heat sink plates, and operationally connected at said one end to the other end of said cable, and said straps fastened to and supporting and operationally connecting to said D.C. positive output busbar at the other end.

4,015,185

SEMICONDUCTOR SWITCHING CIRCUIT WITH TRANSISTOR SWITCHING POWER LOSS REDUCTION MEANS

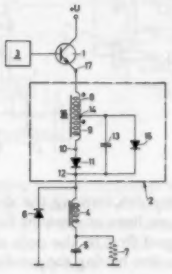
Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Sept. 11, 1975, Ser. No. 612,535

Claims priority, application Germany, Sept. 13, 1974, 2443892; Oct. 10, 1974, 2448408

Int. Cl.² H02M *3/155*

U.S. Cl. 321—44 **5 Claims**



1. A semiconductor switching circuit including a semiconductor switch having a switching path and a control electrode, said control electrode connected to a source of control signals; a voltage source; an inductor; a capacitor; a series combination comprising said inductor and said capacitor connected across said voltage source in series with said switching path; a diode; means connecting said diode in parallel with said series combination, said diode poled to pass current in response to inductive turn-off voltages appearing on said inductor; means connecting a load in parallel with said capacitor; a further inductor and a further diode; said further inductor and further diode connected in series combination coupled between said switching path and said series combination of said inductor and capacitor, said further diode poled to be energized in the forward direction in response to both turning on and turning off of said semiconductor switch; and further comprising an additional capacitor, and means connecting said additional capacitor to be charged by way of said further diode by the energy stored in said further inductor, whereby the power lost upon switching on said semiconductor switch is reduced.

4,015,186

SYSTEM FOR LIMITING TORQUE IN A TURBINE-GENERATOR SHAFT

Kurt Fork, Rosenbach near Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 23, 1975, Ser. No. 615,842

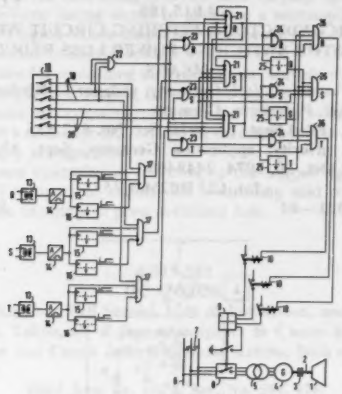
Claims priority, application Germany, Oct. 11, 1974, 2448635

Int. Cl.² H02H *3/00, 7/06*

U.S. Cl. 322—8 **2 Claims**

1. System for limiting the torque produced in a turbine generator shaft when a three-pole electric supply net short circuit is switched off comprising at least one power switch connected between the generator and a location of a supply net having three phase lines wherein a short circuit is formed, said power switch having a respective switch member for each of the poles of the three-pole supply net and a respective actuating coil for displacing each of said switch members, and a selector device connected to said actuating coils for actuat-

ing the latter to displace said switch members so as to switch off two phase lines with a delay relative to switching off the third phase line that is greater than the duration of a half-wave of the supply net voltage, said selector device comprising



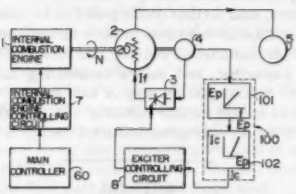
measuring means for determining the d-c component of the currents in said phase lines and means for accordingly directing a switch-off signal first to the pole of said power switch that is in the phase line having the smallest d-c component.

4,015,187

EXCITER ARRANGEMENT FOR GENERATORS

Akio Sasaki; Kiyoteru Kuwabara, and Hisakatsu Kiwaki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1974, Ser. No. 512,156
Claims priority, application Japan, Oct. 8, 1973, 48-112353
Int. Cl.² H02P 9/04
U.S. Cl. 322—14 **18 Claims**



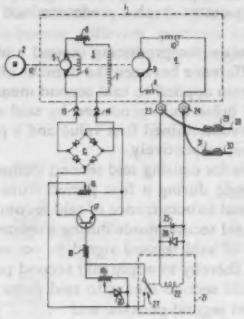
1. An exciter arrangement for generators comprising an internal combustion engine, main and auxiliary generators both being driven by said internal combustion engine, exciter means including static exciter means for receiving the output of said auxiliary generator for supplying an exciting current to said main generator, a detecting circuit for producing an output corresponding to the rotational speed of said internal combustion engine in response to the output of said auxiliary generator, a command circuit for producing a command for said exciting current as a function of said output of said detecting circuit, and a control for controlling the operation of said static exciter means according to said command circuit, wherein said command circuit sets the value of said exciting current at a small value greater than zero when the rotational speed of said engine is less than a predetermined value and at a value which varies substantially in a linear relationship with variation of the rotational speed of said engine when the rotation speed is greater than said predetermined value.

4,015,188

WELDING GENERATOR EXCITER CONTROL

Albert P. Denis, 2050 Brookview Road, Castleton, N.Y. 12033

Filed Sept. 19, 1975, Ser. No. 614,982
Int. Cl.² H02P 9/10, 9/26
U.S. Cl. 322—28 **5 Claims**



1. A method of controlling the open circuit output voltage of a separately excited, differentially compounded welding generator prior to arc start, said welding generator including an exciter armature connected in series with generator separately excited fields and a generator supplying output terminals, said method comprising the steps of:

breaking of the series connection between said exciter armature and said generator separately excited fields;

inserting an exciter current control device across the broken connection;

sensing the open circuit output voltage across said output terminals; and

regulating the exciter current control device in response to the sensed output voltage, said exciter control device including a transistor having its collector to emitter circuit electrically connected in series between said exciter armature and said generator separately excited fields and the step of regulating comprises of the steps of:

connecting a first base bias circuit to said transistor to maintain a minimum voltage output from said generator and prevent loss of excitation when the open circuit output voltage sensed across said output terminals is below a predetermined value; and

connecting a second voltage regulated base bias circuit to said transistor when the open circuit output voltage sensed across said output terminals exceeds said predetermined value.

2. An exciter control circuit for controlling the open circuit output voltage of a separately excited, differentially compounded welding generator including an exciter armature connected in series with generator separately excited fields and a generator connected to supply output terminals, comprising:

voltage sensing means connected to said output terminals for providing a regulating signal in response to the sensed open circuit output voltage across said output terminals;

a transistor having its collector to emitter circuit electrically connected in series between said exciter armature and said generator separately excited fields;

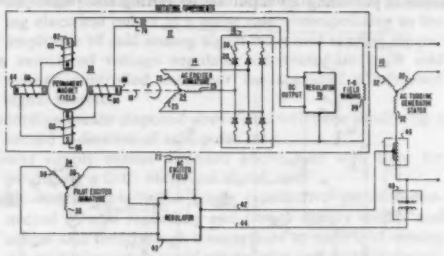
a first base bias circuit connected to said transistor to maintain a minimum voltage output from said generator and prevent loss of excitation when the open circuit output voltage sensed across said output terminals is below a predetermined value; and

a second voltage regulated base bias circuit connected to said transistor in response to said regulating signal only when the open circuit output voltage across said output terminals exceeds said predetermined value.

4,015,189
SUPPLEMENTAL FIELD EXCITATION FOR PERMANENT MAGNET ROTOR OF PILOT EXCITER

Dale I. Gorden, North Versailles, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1976, Ser. No. 666,810
Int. Cl.² H02P 9/14
U.S. Cl. 322—46 2 Claims



1. In a synchronous dynamoelectric machine having a rotor member disposed upon a shaft, said shaft being disposed for rotation by a prime mover, a field winding disposed on said rotor member, a main exciter having a stator member carrying a field winding and a rotor member disposed on said shaft carrying an armature winding, a rotatable rectifier assembly operable to convert alternating current to direct current having an input circuit connected to receive alternating current excitation from said main exciter armature and an output circuit connected to conduct direct current excitation through said synchronous dynamoelectric machine field winding, a pilot exciter operable to derive electrical power from the rotational energy of said shaft, said pilot exciter having a permanent magnet rotor member comprising a plurality of permanent magnets arranged in alternating magnetic polarity to establish a rotating magnetic field when said shaft is rotated, and said pilot exciter having a stator member carrying an armature winding which is coupled by magnetic induction with the magnetic field provided by said permanent magnet rotor member,

the combination with said pilot exciter of a plurality of field coils disposed upon selected ones of said permanent magnets, said field coils being connected together in series electrical relation to constitute a field winding, and means for deriving direct current excitation from the output circuit of said rotating rectifier assembly connected to supply a predetermined function of said direct current excitation to said permanent magnet field winding.

4,015,190
CONTROLLABLE NEGATIVE RESISTANCE ELECTRONIC SWITCH ARRANGEMENT

Lorenz Gasser, Stuttgart-Mohringen, and Kalman Széchényi, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,547
Claims priority, application Germany, Apr. 22, 1974, 2419357
Int. Cl.² G05F 1/40
U.S. Cl. 323—4 6 Claims

2. A arrangement for reversing the damping of electronic switches having linear current voltage characteristics comprising:

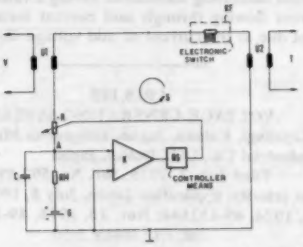
current input means for coupling current into said arrangement;

an electronic switch;

a controllable negative resistance;

a series resistor;

a dc voltage source, said electronic switch, said controllable resistance, said series resistor, and said dc source are connected in series, so that current is coupled in and out of said arrangement on both sides of said electronic switch, said series resistor and dc source are shunted by a capacitor to provide alternate current transfer, and a comparator circuit provides measurement for a voltage drop across said dc source and said resistor for transmitting said voltage drop to a controller whereby said controller adjusts said negative resistance in order to cause said voltage drop to disappear;



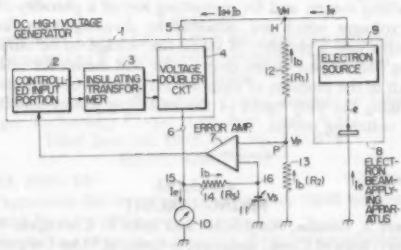
wherein said negative resistance comprises two operational amplifiers having a plurality of inputs coupled with a respective plurality of outputs by means of a plurality of feedback resistances so that said electronic switch is coupled to an inverting input of a first operational amplifier, and a non-inverting input of said first operational amplifier is coupled to an inverting input of a second operational amplifier by means of a resistor, and a non-inverting input of said second operational amplifier is connected to said series resistor; and

current output means for coupling current out of said arrangement.

4,015,191
D.C. HIGH VOLTAGE POWER SOURCE WITH PRECISE LOAD CURRENT MEASUREMENT

Masahide Okumura, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 9, 1976, Ser. No. 656,435
Claims priority, application Japan, Feb. 14, 1975, 50-17293
Int. Cl.² G05F 1/46
U.S. Cl. 323—16 10 Claims



1. A d.c. high voltage power source comprising:

a d.c. high voltage generator having high and low voltage outputs terminals;

voltage divider means connected to said high voltage output terminal of said generator for detecting the output voltage of said high voltage generator;

a reference voltage source,

error amplifier means connected to said voltage divider means and said reference voltage source for detecting an amplifying the voltage difference between the voltage

detected by said voltage divider and the reference voltage derived from said reference voltage source;

control means for controlling the output voltage of said high voltage generator in response to the output of said error amplifier so as to maintain said output of said error amplifier substantially equal to zero;

a current measuring instrument connected between said low voltage output terminal of said d.c. high voltage generator and ground potential; and

correcting means for applying a correcting current to said current measuring instrument having a value equal to the current flowing through said current measuring instrument due to the current of said voltage divider means.

4,015,192

VOLTAGE GENERATING SYSTEM

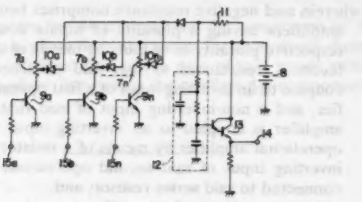
Yukio Koyanagi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 3, 1975, Ser. No. 592,992

Claims priority, application Japan, July 5, 1974, 49-77550; Nov. 15, 1974, 49-132144; Nov. 15, 1974, 49-132145

Int. Cl.² H04N 5/50

U.S. Cl. 323—19 **11 Claims**



1. A voltage generating system comprising: a plurality of means for generating at lest two different reference voltages V_A and V_B; a plurality of switching means, coupled to said reference voltage generating means, respectively, for selectively taking out the reference voltages; a switching pulse generating means for generating switching pulses and for supplying the switching pulses to said switching means, the switching pulses having certain duty ratios to cause at least one of said switching means to switch with a certain duty ratio, and the other said switching means to switch to their on state or with an inverse phase with respect to the switching phase of said at least one switching means; smoothing means for smoothing the switched reference voltages taken out from said switching means, and for outputting any of a plurality of output voltages which are obtained by dividing the reference voltages into a plurality of steps, the voltage to be outputted being determined by the duty ratios; and means for selecting which of the plurality of output voltages is to be outputted by changing the duty ratios of the switching pulses supplied to said switching means.

4,015,193

FIRING CIRCUIT

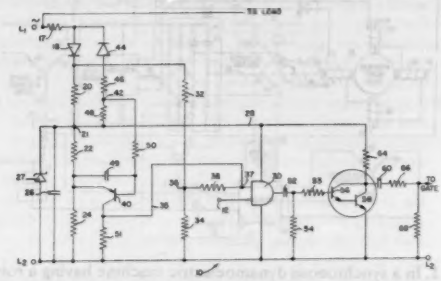
Robert S. Lundin, Northfield, and John F. Carragan, Woodbury, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Nov. 11, 1975, Ser. No. 631,172

Int. Cl.² G05F 3/04

U.S. Cl. 323—19 **4 Claims**

1. A firing circuit providing an input signal during each half cycle at a control gate of a semiconductor device in a load circuit across an alternating current source, each said input signal energizing said load circuit during the remainder of said half cycle, and said firing circuit comprising a logic gate having a pair of input terminals, control means providing an input signal at one of said input terminals, first circuit means including a first diode connected between said alternating current source and the other of said input terminals providing half wave rectification during the positive half cycle of said alternating current source, a pair of voltage divider means, said voltage divider means connected in series with said diode across said alternating current source, said pair of voltage divider means including a first junction and a second junction at a lower voltage potential, second circuit means connected between said alternating current source and said other input terminal providing an input signal during the negative half



cycle of said alternating current source, said second circuit means including transistor means, the emitter of said transistor means being connected to said second junction, and a second diode connecting the base of said transistor means to said alternating current source during said negative half cycle, said logic gate providing an output signal during each half cycle, a D.C. source connected to said first junction, said logic gate being powered by said D.C. source, and means for electrically connecting said logic gate output signals to said control gate at selected times during each half cycle.

4,015,194

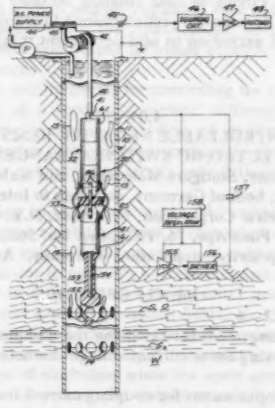
OIL WELL LOGGING DEVICE HAVING PLURAL WELL FLUID PARAMETER MEASURING DEVICES AND A SINGLE CONDUCTOR FOR ACCOMMODATING BOTH MEASUREMENT AND POWER SIGNALS

Karol E. Epling, Fountain Valley, Calif., assignor to Production Data Inc., Long Beach, Calif.

Filed July 3, 1975, Ser. No. 592,981

Int. Cl.² G01V 3/18

U.S. Cl. 324—1 **4 Claims**



1. An instrumentation array for use in oil well logging, by measuring the parameters of the fluid in the well, comprising:

a cylindrical housing;

a plurality of circuit segments adapted for axial receipt

within said housing, each circuit segment including feedthrough connections to transfer electrical signals between adjacent ones thereof;

a plurality of sensing means interposed between selected ones of said segments, each sensing means being adapted to respond to a selected physical parameter of said fluid by producing a continuous analog signal indicative in amplitude of the amplitude of said parameter;

an associated voltage controlled oscillator connected and disposed proximate each said sensing means for producing electrical pulses at a pulse rate corresponding to the amplitude of said analog signal from said sensing means;

an associated voltage regulator connected to each said voltage controlled oscillator for applying a reference signal thereto;

recording means disposed above said well bore producing a record indicative of said pulse rate;

power supply means disposed above said well bore for producing a D.C. electrical signal; and

cable means including a single conductive element connected to said recording and power supply means and across said feedthrough connections to each said sensing means for conveying said electrical pulses to said recording means and said D.C. electrical signal to each said voltage regulators in superposed relationship thereacross.

4,015,195

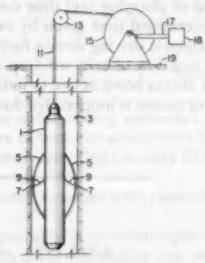
METHOD OF DETERMINING HYDROCARBON SATURATION IN SHALY FORMATIONS BY MEASURING DIELECTRIC CONSTANT IN FIRST AND SECOND PORTIONS OF THE FORMATIONS

Wilmer A. Hoyer, Houston, and Michael M. Spann, Stafford, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 554,997, March 3, 1975, abandoned. This application June 3, 1976, Ser. No. 692,616

Int. Cl.² G01V *3/18, 3/06;* **G01N** *27/00*

U.S. Cl. 324—1 **29 Claims**



1. In a method of electrical well-logging a subsurface shaly sand formation having a first portion thereof saturated with native formation saturants which may include an aqueous saturant and having a second portion thereof adjacent said first portion in which native formation saturants have been at least partially displaced by injected fluids, wherein the relation between dielectric constant and conductivity due to shaliness is utilized to determine the aqueous portion of the native formation saturants, the steps comprising:

making a first measurement of dielectric content at a selected frequency less than about 50 KHz in said first portion of said formation; and

making a second measurement of dielectric constant at said selected frequency in said second portion of said formation.

4,015,196

ANALYSIS OF MATERIALS

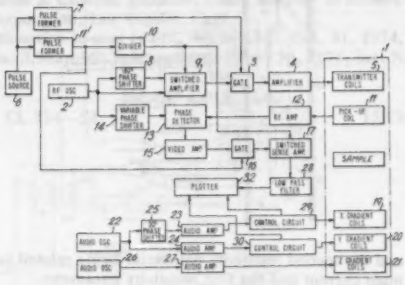
William Stanley Moore, Nottingham, England, and Waldo Stephen Hinshaw, Pittsburgh, Pa., assignors to National Research Development Corporation, London, England

Filed Apr. 3, 1975, Ser. No. 564,833

Claims priority, application United Kingdom, Apr. 5, 1974, 15280/74; Oct. 7, 1974, 43365/74

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 R **7 Claims**



1. A method of investigating a sample, the method comprising the steps of:

causing gyromagnetic resonance to occur in said sample by irradiating said sample with radio frequency energy while subjecting said sample to a magnetic field, said field having a systematically varying non-homogeneous component such that said field is substantially invariant with time in a localized volume of said sample but varies with time in all other parts of said sample;

receiving from said sample a signal resulting from said gyromagnetic resonance; and

deriving from said signal information relating to gyromagnetic resonance effects specific to said localized volume, said information being distinguished by virtue of the difference between said localized volume and said other parts of said sample in respect of the time dependence of said field.

4,015,197

METHOD AND APPARATUS FOR DETERMINING PERMEABLE ZONES IN SUBSURFACE EARTH FORMATIONS

Christian M. Clavier, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 24, 1975, Ser. No. 589,970

Int. Cl.² G01V *3/18*

U.S. Cl. 324—10 **16 Claims**

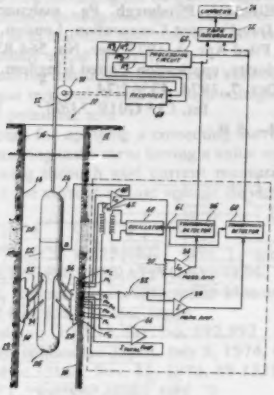
1. Apparatus for investigating subsurface earth formations traversed by a borehole, comprising:

a. means for supporting a plurality of electrodes adapted for movement in a borehole, the plurality of electrodes including at least one current emitting electrode adapted for emitting current into a borehole and the formation surrounding a borehole;

b. means for emitting a main and an auxiliary current from the at least one current emitting electrode, the main current flowing primarily in the formation surrounding a borehole and the auxiliary current being confined primarily to a borehole and the formation immediately surrounding a borehole; and

c. means for detecting said main and auxiliary currents to

produce first and second resistivity parameters, the first resistivity parameter being related to the auxiliary current



and the second resistivity parameter being related to the main current and the first resistivity parameter.

4,015,198

SHUTTER-TIME-PREFERENCE SINGLE LENS REFLEX CAMERA WITH AUTOMATIC FILM WIND-UP

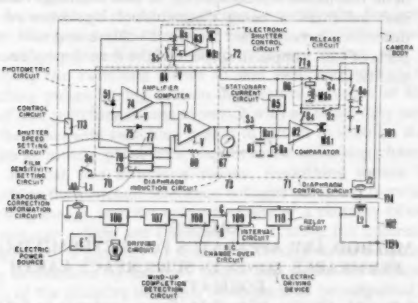
Tomonori Iwashita, Chofu; Hiroshi Aizawa, Machida; Susumu Kozuki, Yokohama; Masanori Uchidoi, Kawasaki; Tadashi Ito, Yokohama, and Yukio Iura, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1974, Ser. No. 534,151

Claims priority, application Japan, Dec. 26, 1973, 48-493253; Apr. 15, 1974, 49-4942449

Int. Cl.[2] G03B 7/14, 1/18

U.S. Cl. 354—29 **13 Claims**



13. A shutter time preference single lens reflex camera having an electric driving device, which comprises:

1. a camera body having,

a. a photographing lens having a diaphragm device,

b. means for measuring transmitted light of the photographing lens,

c. photographing information setting means having shutter time setting means,

d. computation means for computing the output of the photometric means and the output of the photographing information setting means,

e. diaphragm control means for controlling the operation of the diaphragm device, which means determines the diaphragm aperture of the diaphragm device in correspondence to the output computation of the computation means,

f. time control means for controlling shutter time in correspondence to the value set by the shutter time setting means,

g. means for actuating the diaphragm control means and the time control means,

h. magnetic release means for driving the actuating means,

i. a first switching means for controlling conductivity of the magnetic release means,

j. operation means for controlling "on" and "off" of the switching means,

k. film winding means for charging the time control means and the diaphragm control means,

l. a second switching means for controlling the action of said electric driving device, which second switching means changes over to a first position for driving the electric driving device upon completion of the operation of the time control means and changes over to a second position for making non-operative the electric driving device upon completion of charging of the time control means, and

m. connecting means on the camera body side for connecting the second switching means to the electric driving device, having a terminal on the camera body side connected to the second switching means;

2. an electric driving device comprising:

a. winding driving means which is engageable with the winding means,

b. connecting means on the electric driving device side for connecting the second switching means on the camera body side, said connecting having a terminal on the electric driving side connecting to the terminal on the camera body side,

c. control means for controlling the winding driving means, said control means being operative when the terminal on the electric driving device side is connected and the second switching means is changed over to the first position, and being non-operative when the second switching means is changed over to the second position,

in which said electric driving device further comprises a delay circuit which starts to operate upon the change-over of the second switching means to the first position, said circuit being functional for making said wind-up drive control means to be inoperative when the period between completion of operation and completion of charging said time control means is longer than the predetermined time given by said delay circuit; and in which said electric driving device further comprises means for indicating inaction of said wind-up drive control means, said indication means being active to indicate when said wind-up drive control means is inoperative due to said relay circuit.

4,015,199

CELL FOR MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY OF LIQUIDS

Klaus Rommel, Jona, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Oct. 29, 1975, Ser. No. 627,020

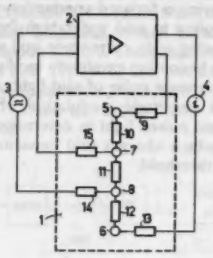
Claims priority, application Switzerland, Nov. 14, 1974, 15176/74

Int. Cl.[2] G01N 27/42

U.S. Cl. 324—30 B **10 Claims**

1. In a cell for measurement of electrical conductivity of liquids having two current electrodes with a defined spacing therebetween and voltage electrode means for providing a voltage tap-off according to the four electrode measuring technique, the improvement wherein the voltage electrode means comprises at least two voltage electrodes associated with each current electrode, the at least two voltage elec-

trodes being electrically connected in parallel for providing a voltage tap-off and being disposed along an equipotential line

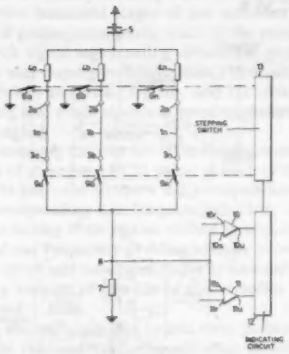


around a current electrode at positions on the equipotential line.

4,015,200
MULTICONDUCTOR CABLE TESTING APPARATUS

Mix Tommy Strandh, Horby, Sweden, assignor to Malmo Testequipment AB, Horby, Sweden

Filed Nov. 24, 1975, Ser. No. 634,350
Claims priority, application Sweden, Nov. 25, 1974, 7414740
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **5 Claims**

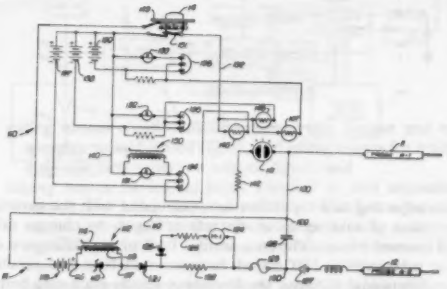


1. A multiconductor cable testing apparatus, comprising:
a. a plurality of pairs of terminal connectors for connection to the ends of a corresponding plurality of conductors to be tested;
b. a test voltage source in series with each of said pairs of connectors;
c. a corresponding plurality of normally open first contacts, each in series with a corresponding one of said pairs of terminal connectors;
d. a corresponding plurality of first impedance means, each in series with a corresponding one of said pairs of terminal connectors;
e. second impedance means in series with each of said first contacts;
f. a corresponding plurality of normally open second contacts for applying a reference potential when closed, to one terminal connector of a corresponding one of said pairs of terminal connectors;
g. the testing apparatus having a first testing position wherein a selected one of said first contacts is closed and the corresponding second contact open, and a second testing position wherein said selected one of said first contacts and said corresponding second contact are both closed; and
h. a single voltage sensing means for sensing the voltage across said second impedance means in said first and second testing positions, predetermined values of the sensed voltages across said second impedance means representing open-circuit, short-circuit and incorrect wiring, respectively, for the conductor under test.

4,015,201
ELECTRICAL CONTINUITY AND VOLTAGE TESTING DEVICE

Bertram J. Chaffee, Anaheim, Calif., assignor to Mono-Probe Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 519,747, Oct. 31, 1974, Pat. No. 3,962,630. This application Dec. 30, 1975, Ser. No. 645,386
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **15 Claims**



1. In a circuit testing device,
a. a casing,
b. two probes, one of which projects from the casing
c. a voltage level testing circuit operatively connected with said one probe, and
d. electrical continuity testing circuitry connected between said two probes,
e. said voltage level testing circuit including voltage level indicator means, transistor amplifier means connected with the indicator means to energize same in response to different voltages applied to said one probe, the indicator means connected in the emitter-collector circuitry of the transistor amplifier means, said one probe operatively coupled to the base electrode of said transistor amplifier means, and DC voltage means directly connected with the emitter-collector circuitry of said transistor amplifier means.

4,015,202
AUTOMATIC MEASUREMENT AND DISPLAY OF RESONANCE FREQUENCIES OF SEISMIC DETECTION ELEMENTS

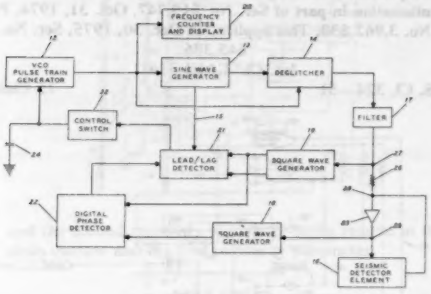
Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,606
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 Q **7 Claims**

1. Circuit means for automatically determining the resonance frequency of a seismic detector element of a geophysical data acquisition system, comprising:
a. a sine wave voltage synthesizer generating a series of discrete voltages changing from one discrete voltage value to the next discrete value in response to activation pulses of a relatively high repetition rate, the entire series of discrete voltages collectively approximating an ideal smooth first sinusoidal voltage, said relatively high repetition rate being at least a hundred times the frequency of said approximated first sinusoidal voltage;

means responsive to said first sinusoidal voltage for imposing across said seismic detector element a second sinusoidal voltage identical in frequency therewith for driving through said element a current exactly inverse to a reference current driven through a pure resistance by said first sinusoidal voltage;

c. automatic means responsive to said first and second sinusoidal voltages for (i) first sensing a phase difference between said first voltage driving said reference current through said pure resistance and said second voltage driving the inverse of said reference current through said seismic detector element, and (ii) then automatically



adjusting said repetition rate associated with the generation of said series of discrete voltages, to change said sensed phase difference until a final phase difference of substantially 180° exists between said first and second sinusoidal voltages, the frequency finally occurring being the resonance frequency of said seismic detector element; and

d. means for continuously indicating and displaying the frequency of said sinusoidal voltages, including said finally occurring resonance frequency, with relatively high precision, by counting the activation pulses of said synthesizer generating said approximated first sinusoidal voltage in a time period Δt given by the relationship:

$$\Delta t = \frac{10^D}{C} \text{ seconds}$$

where D = the number of decimal places desired in the frequency to be represented and C = the number of activation pulses associated with said synthesizer per cycle of said generated voltages.

4,015,203

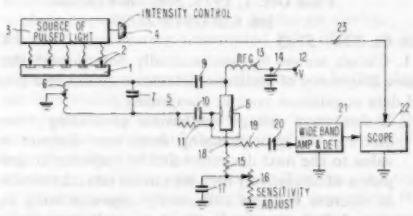
CONTACTLESS LSI JUNCTION LEAKAGE TESTING METHOD

Roger Leonard Verkuil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,759

Int. Cl.² H01J *39/12*; G01R *31/00*

U.S. Cl. 324—158 D **5 Claims**



1. A method for testing PN junctions in a wafer comprising:

irradiating said wafer with pulsed light of selected intensity to charge the capacitance of the junction in a direction tending to render said junction forwardly conductive,

said junction having a forward conduction threshold,

inductively coupling to said wafer high frequency oscillations for inducing eddy currents in said wafer,

said oscillations becoming amplitude modulated each time said wafer receives a pulse of said light, and

monitoring said amplitude modulation while varying the intensity of said pulsed light to determine a value of said pulsed light which charges said capacitance to a value beneath said threshold.

4,015,204

METHOD OF TELECOMMUNICATIONS

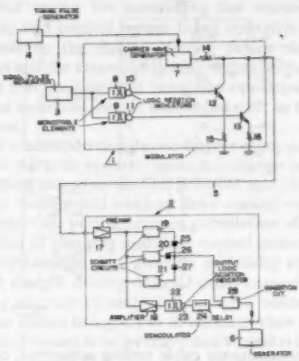
Kuniaki Miyazawa, 1548 Nishioizumicho, Nerimaku Tokyo, Japan (177)

Filed Aug. 8, 1975, Ser. No. 603,227

Claims priority, application Japan, Aug. 21, 1974, 49-94943; Sept. 6, 1974, 49-102823

Int. Cl.² H04B *1/00*

U.S. Cl. 325—38 R **18 Claims**



1. A method of telecommunication comprising

providing a plurality of separate carrier waves of different frequency,

providing a train of binary signals,

dividing said binary signals into groups, one group for each of said plurality of carrier waves,

the ratio of the frequency of a carrier wave to the number of binary signals in the group that is complementary to that particular carrier wave being the same for each carrier wave and its complementary group of binary signals,

amplitude modulating each carrier wave according to its complementary group of binary signals with the amplitude of at least a part of each cycle of each carrier wave representing one binary signal,

transmitting said modulated carrier waves to a receiving location,

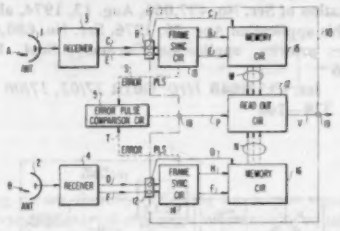
demodulating, at the receiving location, each carrier wave to extract therefrom the group of binary signals that it carried, to thereby provide a plurality of separate groups of binary signals, and

combining the separate groups of binary signals to reconstruct the first-named train of binary signals.

4,015,205
BASEBAND SIGNAL SWITCHING ARRANGEMENT FOR DIVERSITY RECEPTION IN A PCM RADIO COMMUNICATION SYSTEM

Kiyoshi Ikeda, and Toshihiko Mitani, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,785
Claims priority, application Japan, Feb. 17, 1975, 50-20264
Int. Cl.² H04B 7/08
U.S. Cl. 325—304 **2 Claims**



1. A baseband signal switching arrangement for diversity reception in PCM communication system of the type having a receiver for each of a plurality of propagation paths, said switching arrangement comprising:

a plurality of $1/n$ write-in frequency-dividing counters (n being a positive integer equal to or larger than 2), said $1/n$ write-in frequency-dividing counters being provided at respective baseband stages of the receivers for said plurality of propogation paths, each of the receivers including clock signal regenerating circuits for producing clock signals and frame synchronization circuits for producing error pulses and frame signals, said $1/n$ write-in counters counting said clock signals in response to being reset by a frame signal;

n buffer memory circuits for successively writing bit information of a received PCM signal at each of said baseband stages in response to the n frequency-divided outputs of the corresponding $1/n$ frequency-dividing counter, said outputs having their phases shifted in sequence;

a $1/n$ read-out frequency-dividing counter provided in common to all of said baseband stages to successively read out memory outputs of one set of said n buffer memory circuits; and

switching means responsive to said error pulses for enabling said $1/n$ read-out frequency-dividing counter to selectively read out memory outputs of a given set of said n buffer memory circuits.

4,015,206
PROTECTIVE RELAYING MODEM RECEIVER

Christopher Ryland Huntley, Burnaby, Canada, assignor to GTE Lenkurt (Canada) Ltd., Burnaby, Canada

Filed Dec. 22, 1975, Ser. No. 643,166
Int. Cl.² H04B 1/16
U.S. Cl. 325—435 **6 Claims**

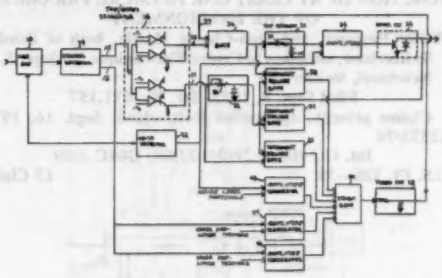
1. A receiver for receiving and distinguishing between first and second mutually exclusive signal frequencies transmitted in a defined frequency channel of center frequency f_o by remote transmitting means which comprises:

an input means for receiving a signal that is at said first or said second signal frequency;

channel detector means turned to the frequency f_o coupled to said input means and generating first and second DC signals appearing at first and second channel detector outputs respectively, said first DC signal being proportional to the difference in frequency between the center frequency f_o and the frequency of the received signal, said first DC signal thereby having either a first or a second DC amplitude, and said second DC signal being proportional to the amplitude of the received signal;

separator means coupled to said first channel detector output for generating a first separator output signal when said first DC signal is at said first DC amplitude and a second separator output signal when said first DC signal is at said second DC amplitude;

comparator means coupled to said second channel detector output for generating an output inhibit signal when the amplitude of said second DC signal varies by a predetermined amount;



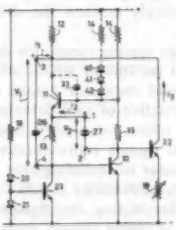
gating means coupled to said comparator output and responsive to said inhibit signal, said gating means for inhibiting said first separator output signal; and

timing means having an input coupled to said separator output, and being responsive only to said first separator output signal, said timing means for generating a control signal after said first separator output signal is present for a predetermined period of time at said timing input, said control signal being operable to control electrical functions external to the receiver.

4,015,207
ANTI-RECIPROCAL NETWORK

Johannes Otto Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,591
Claims priority, application Netherlands, Nov. 14, 1974, 7414850; Dec. 18, 1974, 7416482
Int. Cl.² H03H 7/44, 11/00
U.S. Cl. 333—80 T **9 Claims**



1. An anti-reciprocal network, comprising:

a first and a second port, each having two terminals, included in a closed loop being formed, in order, by the first terminal of the first port, a first impedance element, a second impedance element, the first and the second terminal of the second port, a third impedance element, and the second terminal of the first port;

a first transistor having a base-collector path included between the second terminal of the second port and the first terminal of the first port, the emitter of said first transistor being connected to its base through a resistor, the connection point of said emitter and said resistor being connected to a point of constant potential; and

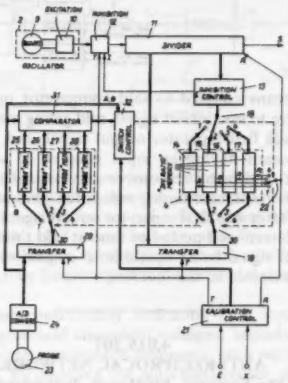
a second transistor having a collector-emitter path included

between said first terminal of said second port and said second terminal of said first port, the base of said second transistor being connected to the terminal of the first impedance element which is remote from said first terminal of said first port.

4,015,208
FREQUENCY GENERATOR COMPENSATED AS A FUNCTION OF AT LEAST ONE PHYSICAL PARAMETER OF THE ENVIRONMENT

Walter Hammer, and Jean-Claude Martin, both of Boudry, Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Sept. 8, 1975, Ser. No. 611,157
Claims priority, application Switzerland, Sept. 16, 1974, 12533/74
Int. Cl.² H03K *21/00, 23/06;* G04C *3/00*
U.S. Cl. 328—39 **13 Claims**



1. A compensated frequency generator, comprising: time-base oscillator means;

divider means coupled to said oscillator means for dividing the

output frequency of said oscillator means;

a first plurality of memory means coupled to said divider means for storing a plurality of predetermined division ratios to selectively control the division ratio of said divider means;

physical parameter sensing means for detecting a predetermined physical parameter which affects the oscillation frequency of said oscillator means and for generating signals representative of said detected physical parameter; Converter means coupled to said sensing means for converting said signals representative of said detected physical parameter to coded signals;

a second plurality of memory means coupled to said converter means for storing the signals generated by said sensing means as coded signals, each of said second plurality of memory means storing a coded signal representing one of said detected physical parameter values;

comparing means for comparing the signals generated by said sensing means with the coded signals stored in said second plurality of memory means and for generating output signals representing coincidence between the output of said sensing means and said second memory means;

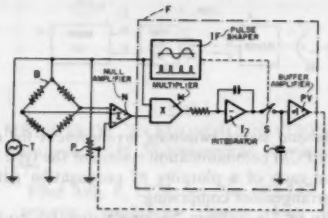
control means coupled to said comparing means and to said first plurality of memory means for selectively coupling one of first said memory means to said divider means as a function of the output of said comparing means; and

calibration means coupled to said control means, said divider means and said first and second memory means for controlling inscription into said first memory means of said predetermined division ratios and for controlling inscription into said second memory means of coded signals representing predetermined values of said physical parameter detected by said sensing means.

4,015,209
CARRIER WAVE COMPENSATOR WITH INTERFERENCE SUPPRESSION CIRCUIT MEANS

Dietrich Meyer-Ebrecht, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 497,066, Aug. 13, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,457
Claims priority, application Germany, Sept. 14, 1973, 2341066
Int. Cl.² H04B *1/10;* G01R *27/02, 17/06*
U.S. Cl. 328—162 **5 Claims**



2. An electrical measuring system with means for suppressing interference voltages comprising, a source of AC supply voltage, a measuring bridge having input terminals coupled to the AC supply source, an amplifier having input means coupled to the output terminals of the measuring bridge, and compensation feedback means coupled to the output of said amplifier for deriving a compensation signal for compensating the bridge unbalance to be measured, said compensation feedback means comprising, a multiplier having first and second inputs coupled to the output of the amplifier and the AC supply source, respectively, an integrator with its input coupled to the output of the multiplier, and a sample and hold circuit coupled to the output of the integrator and comprising a capacitor coupled to the integrator output via a sampling switch and pulse generator means coupled to the AC supply source for generating short duration control pulses during the zero crossover passages of the AC supply and which control pulses periodically control the operation of the sampling switch.

4,015,210
CIRCUIT FOR DETECTING PREDETERMINED VOLTAGE LEVEL CROSSINGS OF THE MODULATING COMPONENT OF A FREQUENCY MODULATED SIGNAL

Stephen F. Weiss, 2157 N. 64th, Seattle, Wash. 98103

Filed Apr. 15, 1976, Ser. No. 677,365
Int. Cl.² H03D *3/18;* H03K *9/06*
U.S. Cl. 329—50 **5 Claims**

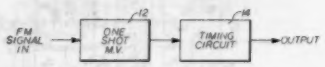
1. A circuit for detecting the crossing of a predetermined voltage level by a modulating signal component of a frequency modulated signal, comprising:

a. means adapted to receive at an input connection thereof the frequency modulated signal for generating a series of pulses coincident in time with the same point on successive cycles of the waveform of the frequency modulated signal, the interval between successive pulses in said series of pulses being a varying interval of time in accordance with a variation in frequency of the frequency modulated signal;

b. timing means for generating a train of pulses having a preset interval of time between successive pulses thereof, said preset interval of time being equal to said varying

interval of time when the modulating signal component has an instantaneous voltage level which is equal to said predetermined voltage level;

c. means resetting and initiating said timing means upon the occurrence of each pulse in said series of pulses, said



timing means thereby providing an output signal when said varying interval of time is substantially equal to said preset interval of time, the occurrence of said output signal being indicative that the instantaneous voltage level of the modulating signal component has crossed said predetermined voltage level.

4,015,211

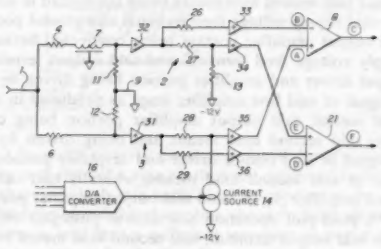
DUAL CHANNEL PULSE WIDTH DETECTOR HAVING DELAY AND D.C. OFFSET MEANS THEREIN

Louis A. Sanchez, San Jose, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 9, 1976, Ser. No. 675,391

Int. Cl.² H03K 9/08

U.S. Cl. 329—106 **10 Claims**



1. A pulse width detector comprising:

a. an input circuit;

b. first and second pulse transmission means coupled to said input circuit, said first transmission means including a delay means therein for delaying pulses emanating from said first channel with respect to pulses emanating from said second channel;

c. offsetting means coupled to at least one of said channels for producing a relative shift between the D.C. levels of said pulses emanating from said channels;

d. first comparator means coupled to said first and second channels for detecting the voltage crossover points of the leading edges of the pulses emanating from said first and second pulse transmission means; and

e. second voltage comparator means coupled to said first and second channels for detecting the voltage crossover points of the trailing edges of the pulses emanating from said first and second pulse transmission means.

4,015,212

AMPLIFIER WITH FET HAVING GATE LEAKAGE CURRENT LIMITATION

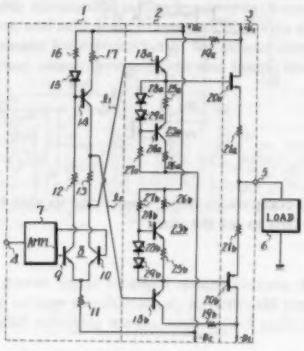
Toshihiko Miyata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1975, Ser. No. 626,370

Claims priority, application Japan, Oct. 31, 1974, 49-125875

Int. Cl.² H03F 3/16

U.S. Cl. 330—13 **22 Claims**



1. An amplifier including a drive stage and an output stage, comprising:

a field effect transistor included in said output stage, one of the source and drain electrodes being connected to an output load and the other of said electrodes being supplied with an operating voltage;

transistor emitter-follower means included in said drive stage having a control electrode supplied with a signal to be amplified and an emitter electrode direct coupled to the gate electrode of said field effect transistor; and

means for limiting the gate leakage current of said field effect transistor including constant current means coupled as a load to said emitter electrode of said transistor means for providing a current of predetermined magnitude, said constant current means also being coupled to said gate electrode of said field effect transistor.

4,015,213

PULSE WIDTH MODULATED SIGNAL AMPLIFIER

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,351

Claims priority, application Japan, Feb. 24, 1975, 50-22589

Int. Cl.² H03F 3/38; H03K 7/08

U.S. Cl. 330—10 **11 Claims**

9. A pulse width modulator comprising:

A. source means for supplying an input signal to be modulated;

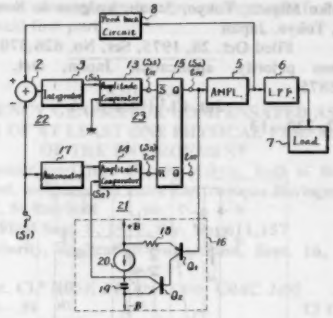
B. means for generating a first reference signal;

C. a first comparator means for comparing said input signal and said first reference signal;

D. bistable circuit means for producing a pulse width modulated signal, the output of said first comparator being connected to said bistable circuit means to reset the same;

E. means for generating a second reference signal; and

F. a second comparator means for comparing said input signal and said second reference signal, the output of said



second comparator being connected to said bistable circuit means to set the same.

4,015,214

PUSH-PULL AMPLIFIER

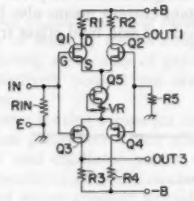
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 3, 1975, Ser. No. 564,751

Claims priority, application Japan, Apr. 9, 1974, 49-40297; Apr. 30, 1974, 49-49860; Apr. 9, 1974, 49-40298

Int. Cl.² H03F *3/185*

U.S. Cl. 330—13 **4 Claims**



1. A push-pull amplifier comprising:

a first amplification circuit including at least one n-channel field effect transistor and having a first output terminal connected to the drain electrode of said n-channel field effect transistor;

a second amplification circuit including at least one p-channel field effect transistor and having a second output terminal connected to the drain electrode of said p-channel field effect transistor;

a constant-current circuit connected in series within a single current path through which the source currents of both said n-channel and p-channel field effect transistors flow in common;

a positive voltage supply connected to the drain current path of said n-channel field effect transistor;

a negative voltage supply connected to the drain current path of said p-channel field effect transistor; and

an input terminal connected to the gate electrodes of both said n-channel and p-channel field effect transistors.

4,015,215

PUSH-PULL POWER AMPLIFIER CIRCUIT

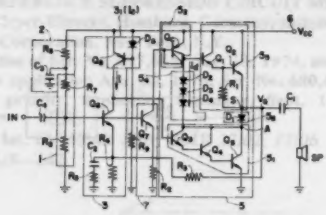
Kunio Seki, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 28, 1975, Ser. No. 608,735

Claims priority, application Japan, Aug. 28, 1974, 49-97908

Int. Cl.² H03F *3/26*

U.S. Cl. 330—15 **22 Claims**



1. A push-pull power amplifier circuit comprising at least supply voltage ripple removing means; first-stage bias means; a first amplifier stage which is composed at least of a firststage amplifying element having an input electrode, an output electrode and a grounding electrode, and first load means, a push-pull output stage which is composed at least of an output driver and amplifier portion, second load means, and an output amplifier portion tending towards conduction with decrease in a drive signal current of said output driver and amplifier portion; a supply voltage feed terminal; and an output terminal; said supply voltage ripple removing means and said first-stage bias means being connected in series between said supply voltage feed terminal and ground potential; said input electrode of said first-stage amplifying element being connected to said first-stage bias means; first and second terminals of said first load means being respectively connected to said supply voltage feed terminal and said output electrode of said first-stage amplifying element; said output driver and amplifier portion being connected between said output terminal and ground potential; said output driver and amplifier portion and said second load means being connected in series between said supply voltage feed terminal and ground potential; said output amplifier portion being connected between said supply voltage feed terminal and said output terminal; said output driver and amplifier portion being driven by an output signal of said first amplifier stage as produced in said first load means; said output amplifier portion being connected to said second load means and being driven by an output signal of said output driver and amplifier portion as produced in said second load means; whereby said output driver and amplifier portion and said output amplifier portion perform a push-pull operation and deliver push-pull output signals to said output terminal; said second load means being provided as a variable impedance means responsive to a voltage generated in said supply voltage ripple removing means to provide an impedance prior to operation of said first amplifier stage for preventing operation of said output amplifier portion.

4,015,216

FREQUENCY-VOLTAGE CONVERTER AND A STABILIZED PULSE GENERATOR USING IT

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed July 24, 1975, Ser. No. 598,803

Claims priority, application Japan, July 31, 1974, 48-87007; July 31, 1974, 48-87015

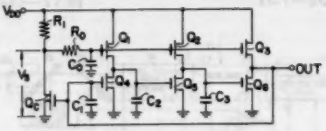
Int. Cl.² H01L *29/78;* **H03K** *1/16*

U.S. Cl. 331—8 **7 Claims**

1. A converter comprising means for connecting a chargepump element to a supply voltage source through a detecting means for detecting an electrical parameter derived from

the charge-pump element, means for supplying an alternating input signal to the gate electrode of said charge-pump element, and output means coupled to the connection point between said charge-pump element and said detecting means.

2. In an oscillator haing variable impedance means to substantially determine the frequency of the output signal thereof by the variable impedance, wherein an improvement com-



prises means including a charge-pump element for converting the frequency of the output signal into a voltage signal, means for supplying the output signal of the oscillator to a gate electrode of said charge-pump element as the input of said converting means, means for controlling the impedance of said variable impedance means by the output signal of said converting means so as to stabilize the frequency of said output signal of said oscillator.

4,015,217

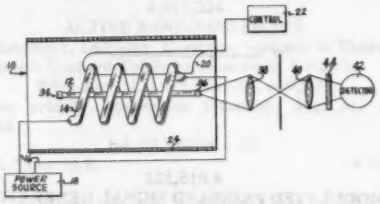
MEANS FOR PRODUCING AND AMPLIFYING OPTICAL ENERGY

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 168,012, Jan. 16, 1962, which is a continuation-in-part of Ser. No. 148,204, Oct. 27, 1961. This application Sept. 10, 1968, Ser. No. 758,796

Int. Cl.² H01S *3/07*

U.S. Cl. 331—94.5 E **7 Claims**



1. A laserable material consisting essentially of a plastic host having a chelate of a rare earth metal dispersed in solid solution therein, which rare earth metal in relation to the prevailing laser emisive light absorptive characteristics of said host supports in said host a sufficient inversion in population between two energy levels of said rare earth metal as to provide at the wavelength of stimulated emission of said rare earth metal, light energy by stimulated emission in excess of all light energy losses in said laserable material.

4,015,218

TEMPERATURE COMPENSATED SOLID-STATE OSCILLATOR

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Continuation-in-part of Ser. No. 467,210, May 6, 1974, abandoned. This application Apr. 10, 1975, Ser. No. 566,840

Int. Cl.² H03K *3/353*

U.S. Cl. 331—111 **16 Claims**

1. A temperature stable oscillator network for connection to a power source for producing an alternating current output signal, said network comprising:

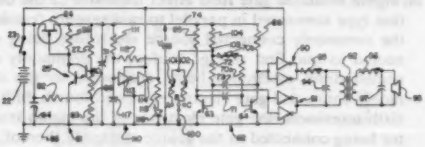
A. an oscillator circuit including:

i. semiconductor switching means having common terminal means for connection to the power source, power input terminal means, control input terminal means and diode junction means including a diode junction connected to said control input terminal means to be forward biased by a voltage thereat, and

ii. timing means for controlling the frequency of oscillation produced by said switching means, said timing means being connected to said control input terminal means for controlling conduction through said diode junction means; and

B. voltage regulator means including:

i. variable conduction means in series between the power source and said oscillator circuit and with input terminal means for connection to the power source, output terminal means connected to said timing means and to



said power input terminal means thereby to apply a single voltage simultaneously to both said timing means and said switching means, and control terminal means, and

ii. control means connected to said control and output terminal means for generating a control signal that varies proportionally with variations in the voltage across said diode junction means that are induced by temperature variations thereby to control the conductivity between said input and output terminal means of said variable conduction means and to vary the voltage that energizes both said timing means and said switching means proportionally as the voltage across said diode junction means, thereby to stabilize the frequency of the alternating current output signal from said oscillator network as a function of temperature.

4,015,219

ELECTRONIC CIRCUIT USING FIELD EFFECT TRANSISTOR WITH COMPENSATION MEANS

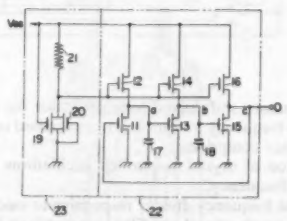
Hiroto Kawagoe, Kodaira, and Kosei Nomiya, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 453,168, March 20, 1974, Pat. No. 3,975,649. This application Nov. 18, 1975, Ser. No. 632,978

Claims priority, application United Kingdom, Jan. 16, 1974, 2105/74

Int. Cl.² H03K *3/33, 3/282*

U.S. Cl. 331—111 **8 Claims**



1. A pulse generator circuit comprising

first, second and third insulated gate field effect transistors of the enhancement type, the drain electrode of the first transistor being connected to the gate electrode of the second transistor, the drain electrode of the second transistor being connected to the gate electrode of the third

transistor, the drain electrode of the third transistor being connected to the gate electrode of the first transistor, the source electrodes of the first, second and third transistors being connected to a first voltage source;

fourth, fifth and sixth insulated gate field effect transistors of the depletion type, the source electrodes of the fourth, fifth and sixth transistors being connected to the drain electrodes of the first, second and third transistors, respectively, the drain electrodes of the fourth, fifth and sixth transistors being connected to a second voltage source, the gate electrodes of the fourth, fifth and sixth transistors being connected in common;

a seventh gate field effect transistor of the enhancement type, the gate electrode of which is coupled to said second voltage source;

an eighth insulated gate field effect transistor of the depletion type connected in parallel to said seventh transistor, the commonly connected source electrodes being connected to said first voltage source, the commonly connected drain electrodes being connected to the commonly connected gate electrodes of said fourth, fifth and sixth transistors, the gate electrode of the eighth transistor being connected to the source electrode thereof; and

a resistor connected between the commonly connected drain electrodes of said seventh and eighth transistors and said second voltage source.

4,015,220

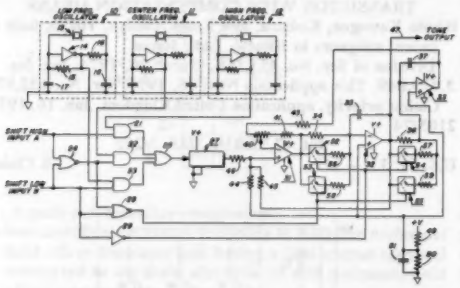
FREQUENCY SHIFT KEYED TONED GENERATOR

Barry M. Kaufman, Pine Brook, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Nov. 3, 1975, Ser. No. 628,568

Int. Cl.² H03C *3/06*

U.S. Cl. 331—179 **2 Claims**



1. A frequency shift keyed tone generator for providing an output tone frequency in response to an applied control signal, said generator comprising,

a. a source of crystal controlled oscillations of predetermined frequency,

b. a digital frequency divider responsive to said oscillations,

c. tracking active bandpass filtermeans driven by the output of said divider and providing a sinewave output, and

d. means controlled by said control signal and simultaneously controlling the output frequency of said divider and the operating frequency of said filter means, the said sine wave output having no phase or amplitude discontinuities when the operating frequency of the said filter means is changed.

4,015,221

PREPARATION OF GRAVURE PRINTING SURFACES

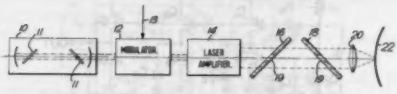
Brian L. Dalton, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Jan. 21, 1976, Ser. No. 650,844

Claims priority, application United Kingdom, Jan. 22, 1975, 2839/75; Mar. 26, 1975, 12763/75

Int. Cl.² H01S *3/10;* **H04N** *1/08*

U.S. Cl. 332—7.51 **7 Claims**



1. Apparatus for removing material from a surface to be engraved, comprising:

a laser and polarising means for generating a polarised coherent light beam to excavate material from the said surface to a depth depending on the beam intensity at the surface;

a polarisation modulator for modulating the polarisation of the beam of coherent radiation;

and an analysing polariser system through which the modulated beam is directed to a focusing lens for focusing the laser beam on to the said surface, the analysing polariser system being formed with a central aperture through which a central portion of the beam passes to the focusing lens regardless of its polarisation, whereby the width, at the surface to be engraved, of that portion of the beam for which the intensity is above the excavation threshold, is maintained substantially constant irrespective of the beam modulation.

4,015,222

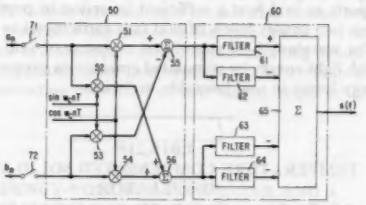
MODULATED PASSBAND SIGNAL GENERATOR

Jean-Jacques Werner, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 1, 1975, Ser. No. 636,563

Int. Cl.² H03C *3/00*

U.S. Cl. 332—9 R **22 Claims**



1. A bandpass signal generator comprising:

means for sampling applied input signals at a preselected rate;

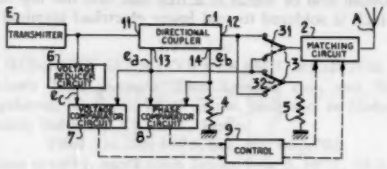
means for multiplying the output signals of said means for sampling by a phasor whose angle is advanced by a preselected additive constant at each sampling interval of said means for sampling; and

means for convolving the output signal of said means for multiplying with a preselected impulse response.

4,015,223
HF ANTENNA MATCHING DEVICE

René Chezé, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 21, 1976, Ser. No. 650,855
Claims priority, application France, Jan. 22, 1975, 75.01969
Int. Cl.² H03H 7/40
U.S. Cl. 333—17 M 3 Claims

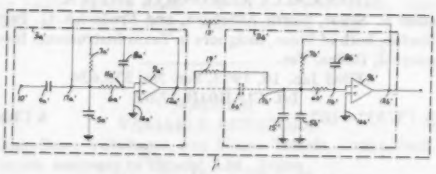


1. A HF antenna matching device comprising: a directional coupler having first and second pairs of conjugate ports, said first pair having first and second ports, said second pair having a high-power port having a given coupling coefficient with said first port and a low-power port having a lower coupling coefficient with said first port, said first and second ports being adapted for respectively coupling to signal generating means and to measuring means during a matching phase a controllable matching circuit for being controlled as a function of the indications of said measuring means during a matching phase; a matched load; and a switching device for coupling the matching circuit to the high-power port and the matched load to the low-power port during a communication phase and vice versa during a matching phase.

4,015,224
ACTIVE BAND-PASS FILTER

Hans Benzinger, Duisburg, Germany, assignor to Thielscher-Electronic Gerhard Thielscher, Duisburg, Germany

Filed July 31, 1975, Ser. No. 600,907
Claims priority, application Germany, July 31, 1974, 2436966
Int. Cl.² H03F 1/36
U.S. Cl. 333—70 R 8 Claims

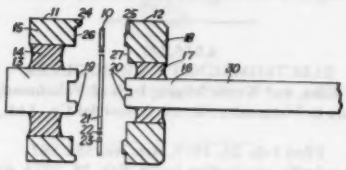


1. An active band-pass filter comprising at least one unit formed from a first and second filter section in tandem, each of said sections including an operational amplifier with an inverting input, a common terminal and an output, said operational amplifier being provided with a resistive/capacitive feedback network having two parallel impedance branches connected between said output and said inverting input, one of said branches being divided into two series impedances of a first type forming a junction therebetween, the other of said branches being an impedance of a second type, one of said types being resistive, the other of said types being capacitive, each of said sections further including a shunt impedance of said second type connected between said junction and said common terminal; an input impedance of said second type connected to said junction of said first section; a coupling impedance of said first type connected between said output of said first section and said junction of said second section; and a feedback impedance of said first type connected between said output of said second section and said junction of said first section.

4,015,225
ENCAPSULATED ELECTROMECHANICAL RELAY

Ronald W. Lomax, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,605
Claims priority, application United Kingdom, Dec. 20, 1973, 59169/73
Int. Cl.² H01H 63/02
U.S. Cl. 335—133 11 Claims

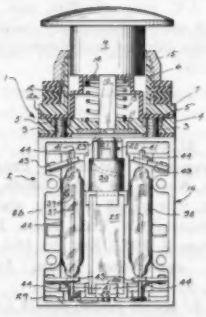


1. An encapsulated electromechanical relay having contact and winding terminals extending from the encapsulation for dual-in-line configurations comprising:
- a first contact unit having a fixed contact provided by an inner ferromagnetic member and an outer ferromagnetic member, said inner member sealed through an aperture in said outer member;
- a ferromagnetic diaphragm movably attached to said outer member at the periphery of said diaphragm, said diaphragm providing a movable contact; and
- a relay winding proximate said diaphragm for providing magnetic attraction to said diaphragm, said diaphragm being positioned apart from said inner member when said relay is non-energized and said diaphragm becoming magnetically attracted into contact with said inner member when said relay is energized.

4,015,226
CARTRIDGE FOR MAGNETICALLY OPERATED CONTACTS

Thaddeus Stomma, and Edwin J. Wroblewski, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 4, 1975, Ser. No. 610,121
Int. Cl.² H01H 13/50
U.S. Cl. 335—206 8 Claims



1. An actuator for magnetically operated switch contacts, the combination comprising:

a cam operator mounted for sliding motion along a switch axis;

a cam member mounted for rotary motion about said switch axis and being responsive to the sliding motion of said cam operator to rotate between first and second positions;

a magnet mounted to said cam member for rotation thereby about said switch axis between first and second positions, said magnet being polarized to generate magnetic flux which extends radially outward from said switch axis;

shunt means mounted for rotation with said magnet for blocking the radial extension of the generated magnetic flux over a sector; and

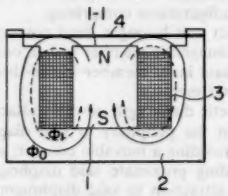
means for mounting said magnetically operated switch contacts alongside said magnet for operation thereby as the magnet is rotated between its two positions.

4,015,227

ELECTROMAGNETIC TRANSDUCER

Yasuhiro Riko, and Kenzo Miura, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 25, 1975, Ser. No. 552,887
Claims priority, application Japan, Feb. 28, 1974, 49-24012
Int. Cl.² H01F *7/08*
U.S. Cl. 335—231 **7 Claims**



1. An electromagnetic transducer, comprising:

a. a diaphragm

b. a first yoke, of U-shaped section and magnetic material, having one end connected to the periphery of said diaphragm, said first yoke including an armature at a center part thereof and a first singkle magnetic flux generating means including a permanent magnet having one end adjacent said armature and providing a D.C. magnetic flux; and

c. a second yoke of magnetic material having a sound outlet and one end connected to the periphery of said diaphragm, said second yoke including a projection at a center part thereof adjacent said armature and a second single magnetic flux generating means including a coil generating an A.C. magnetic flux, said first generating means and said second generating means being spaced apart on opposite sides of said diaphragm to form a balanced transducer.

4,015,228

SURGE ABSORBER

Kazuo Eda, Neyagawa; Masanobu Tanaka, Hirakata; Harumasa Kajita, Neyagawa; Mikio Ishida, Neyagawa, and Michio Matsuoka, Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 5, 1975, Ser. No. 584,211
Claims priority, application Japan, June 10, 1974, 49-66406; July 19, 1974, 49-83457
Int. Cl.² H01H *71/20*; H02H *1/04*
U.S. Cl. 337—28 **20 Claims**

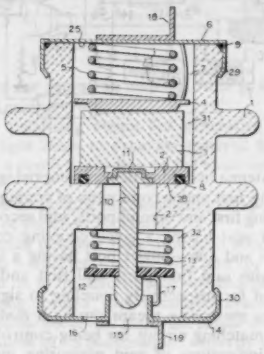
1. A surge absorber comprising:

a hollow insulator having a top and a lower opening at a top and a lower portion thereof, respectively;

a top electrical terminal at said top portion and hermetically sealing said top opening;

a metal oxide varistor positioned in said hollow insulator and having a top and a bottom electrode at the top and bottom surfaces thereof, respectively, the top electrode being electrically connected to said top electrical terminal; and

a sealing means sealing the lower opening of said hollow insulator and comprised of a lower electrical terminal and a conductive rod electrically connected to ground, the bottom end of which is a free end and the top end of which is soldered to said lower electrical terminal by a



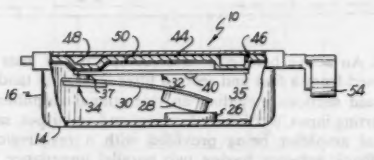
solder, said metal oxide varistor being supported by said top and lower portions of said insulator through said top and lower electrical terminals, respectively, and said conductive rod being thermally connected to said metal oxide varistor through said bottom electrode of said metal oxide varistor and said lower electrical terminal, whereby when said metal oxide varistor is heated by an electric current therethrough to a temperature to heat said solder above the melting point of said solder, said conductive rod is separated from said lower electrical terminal to fall downwardly, thereby stopping the electrical current through said metal oxide varistor to ground.

4,015,229

THERMALLY RESPONSIVE SWITCH

Ronald E. Senor, North Attleboro, and Frederick G. Perry, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,634
Int. Cl.² H01H *61/02*
U.S. Cl. 337—107 **6 Claims**



1. A thermostatic switch comprising an electrically conductive can having a bottom wall and upstanding side walls forming a cavity therein, an outwardly extending flange attached to the free end of the side walls with a upwardly extending lip from two opposite flange portions, a stationary contact mounted on said bottom wall, an electrically conductive lid having a dimple therein, said lid received on said flange for closing said can, an electrically insulative gasket interposed between said flange and said lid with a cut out portion fitted over said dimple, said lip being bent to clampingly engage said

lid and gasket, a flat heater element welded at one end to said dimple and another end extending in cantilever relation therefrom generally parallel to said lid, means for insulating and precisely locating said other end relative to said lid, a thermostatic member cantilever mounted on said other end of said heater and extending alongside said heater, a movable contact mounted on said thermostatic member movable into and out of engagement with said stationary contact, and terminal means attached to said lid and said can respectively.

4,015,230

HUMIDITY SENSITIVE CERAMIC RESISTOR

Tsuneharu Nitta, Katano; Ziro Terada, Yao, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,702

Claims priority, application Japan, Feb. 3, 1975, 50-14508; Feb. 17, 1975, 50-20136; Feb. 12, 1975, 50-18244

Int. Cl.² H01L 7/00

U.S. Cl. 338—35 **17 Claims**

1. A humidity sensitive ceramic resistor comprising a ceramic plate having a conductive electrode secured to a surface thereof; said ceramic plate consisting essentially of, as solid ingredients, more than 98 to 99.95 percent by weight of main component consisting essentially of 99.99 to 80 percent by mole of chromium oxide (Cr_2O_3) and 0.01 to 20 percent by mole of at least one metal oxide selected from the group consisting of titanium oxide, zirconium oxide, hafnium oxide, tin oxide, niobium oxide, tantalum oxide, tungsten oxide, manganese oxide, molybdenum oxide, cerium oxide, dysprosium oxide, vanadium oxide, silicon oxide and germanium oxide; and 0.05 to less than 2 percent by weight of an additive of at least one metal oxide selected from the group consisting of beryllium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, iron oxide, nickel oxide, copper oxide, zinc oxide, cadmium oxide and lead oxide.

4,015,231

VARIABLE RESISTORS

Shougo Seno, Yokohama, and Masao Takeda, Osaka, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 7, 1975, Ser. No. 565,373

Claims priority, application Japan, Apr. 10, 1974, 49-39995

Int. Cl.² H01C 10/34

U.S. Cl. 338—174 **3 Claims**

1. A variable resistor, comprising an insulation plate, a resistance layer of a cermet material formed on said insulation plate, at least one first conductive layer of a cermet material formed on said insulation plate and having one end in contact with one end portion of said resistance layer, a second conductive layer of a cermet material formed on said insulation plate so as to be spaced from said first conductive layer, a metallic slider member having first and second wiper members, means for supporting said slider member on said insulation plate with said first wiper member sliding on said resistance layer and over a selected portion of said first conductive layer and with said second wiper member sliding over a selected portion of said second conductive layer, and additional resistance layers of a cermet material formed on said first and said second conductive layers at least on said selected portions thereof over which said wiper members slide, so that said first

and said second wiper members slide only on said resistance layers.

4,015,232

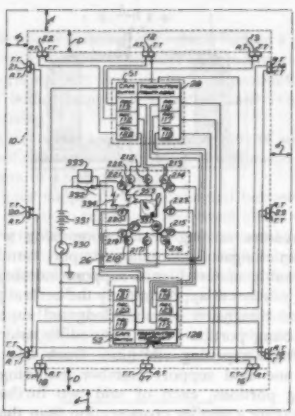
ULTRASONIC DISTANCE DETECTOR FOR VEHICLES

Thomas Sindle, 15 Roosevelt St., Staten Island, N.Y. 10304

Filed Aug. 5, 1975, Ser. No. 602,054

Int. Cl.² G01S 9/66

U.S. Cl. 340—1 T **10 Claims**



1. An ultrasonic distance determining device for use on vehicles and the like comprising:

a plurality of ultrasonic transmitting transducers and receiving transducers each located along the back and front of the vehicle;

an ultrasonic transmitter means having its input coupled to each of said transmitting transducers, said transmitter means comprising an individual transmitter coupled to the input of said transmitting transducers;

a relay receiver coupled to each of said receiving transducers, said relay receiver comprising an individual receiver coupled to the output of each of said receiving transducers;

switch means coupled to the input of said transmitter means and said individual receiver so as to selectively operate said ultrasonic transmitter means for each of said transmitting transducers and then operate a corresponding one of said receiver relays for a predetermined time interval;

indication means comprising a plurality of indicating lamps wherein each of said lamps are connected respectively to the output of said relay receiver for providing an indica-

tion of the proximity of external objects located a predetermined distance from the vehicle corresponding to the predetermined time interval of the individual receiver for each of said transducers; and

said switch means comprising at least one motor, cam means connected to the output shaft of said motor, and electrical contact means coupled to said cam means and responsive thereto for alternately switching between said ultrasonic transmitter means and said relay receiver, said motor having input terminals operatively being connected to a power source, and a rheostat connected to one of said input terminals, said rheostat being operatively connected to a speedometer of the vehicle, and including a sliding pointer for changing the resistance thereof corresponding to predetermined safe distances to be monitored.

4,015,233

PRESSURE SENSOR OF LOW SENSITIVITY WITH RESPECT TO ACCELERATION

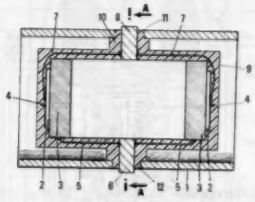
Jean Laurent, St. Germain-en-Laye, and François Villain, Soustons, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, France

Filed Mar. 21, 1974, Ser. No. 453,499

Claims priority, application France, Mar. 27, 1973, 73.11249

Int. Cl.² H04B *13/00*

U.S. Cl. 340—10 **8 Claims**



1. A pressure sensing device comprising a rigid tubular member, an elongated dampening support member of a flexible deformable material, said support member including a projecting portion at approximately the central portion of the longitudinal dimension of said elongated support member, said projecting portion being secured to said rigid tubular member for dampening vibrations from said rigid tubular member, and said support member including two further dampening portions, each of said two further dampening portions having a smaller cross-section than that of said projecting portion, and each of two further dampening portions extending inside said rigid tubular member from opposite sides of said projecting portion to opposite ends of said elongated support member, sensing means including two sensing elements each provided with electrodes, each of said two sensing elements being supported by respective ones of said two further dampening portions at respective opposite ends of said elongated support member, each of said opposite ends of said elongated support member being laterally distant from said projecting portion, and metal terminals arranged within said projecting portion, said metal terminals being operatively connected with said electrodes of said two sensing elements.

8. A pressure sensing device comprising a rigid tubular member having an internal wall, an elongated dampening support member, said support member including at least a projecting portion of a flexible deformable material, said projecting portion including at least two annular sectors projecting from said support member and engaging said internal wall of said rigid tubular member for dampening vibrations from said rigid tubular member, said two annular sectors being annularly separated from one another, and said support member including at least one further dampening portion having a cross-section smaller than that of said annular sectors, said at least one further dampening portion laterally extending inside said rigid tubular member from said two annular sectors, and sensing means provided with electrodes, said sensing means being supported by said at least one further dampening portion an an end position of said support member laterally distant from said two annular sectors.

4,015,234

APPARATUS FOR MEASURING AND FOR WIRELESS TRANSMISSION OF MEASURED VALUES FROM A BORE HOLE TRANSMITTER TO A RECEIVER ABOVEGROUND

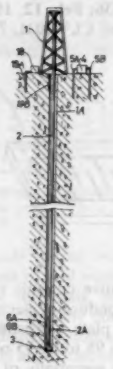
Erich Krebs, Rosskampstrasse 67D, 3 Hannover, Germany

Filed Apr. 3, 1975, Ser. No. 564,666

Claims priority, application Germany, Apr. 3, 1974, 2416063

Int. Cl.² G01V *1/40;* **H04B** *13/02*

U.S. Cl. 340—18 NC **10 Claims**



1. Apparatus for wireless transmission of measurement values from a probe in a well being drilled by a drill bit on a sectional drill rod, comprising an underground unit on a connecting section of the drill rod just above the drill bit and an aboveground unit at the earths surface, said aboveground unit having spaced terminals in the earth, the underground unit comprising two axially spaced electrodes on said connecting section of the drill rod and insulated from one another, a capacitor having its terminals connected respectively with said electrodes, an electrical energy source for charging the capacitor, a short circuiting switch for short circuiting said capacitor, sensing means for sensing measurement values it is desired to transmit and means connecting said sensing means to said short circuiting switch to control the frequency or duration of closing of said short circuiting switch in accordance with a coded value to be transmitted, the energy pulses resulting from said short circulating being transmitted from said electrodes through the earth to said terminals of said aboveground unit.

4,015,235

AIRCRAFT PARKING GUIDANCE INDICATOR

David George Anthony Demaine, Leeds; John David Archer, Halifax, and Richard Lawrence Fisher, Leeds, all of England, assignors to The Rank Organisation Limited, London, England

Filed June 6, 1975, Ser. No. 584,528

Claims priority, application United Kingdom, June 5, 1974, 24884/74

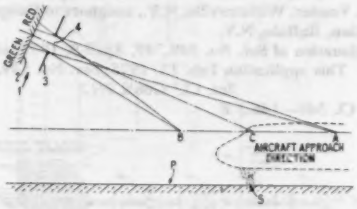
Int. Cl.² G08G *5/00*

U.S. Cl. 340—26 **10 Claims**

1. An optical system for guiding the pilot of a ground-maneuvering aircraft along an approach line to a predetermined ground position such as a parking bay, comprising:

means defining a stop aperture, at least one fixed reference element located in the stop aperture, the reference element obscuring an area of the target as viewed through the stop aperture, said obscured area changing progressively according to the viewing position along said approach line,

a target positioned behind and spaced from the stop aperture, the target and the stop aperture being coaxial and located at a predetermined fixed position above said ground position, the line passing through the center of the target and the center of the stop aperture being inclined downwardly towards the direction of approach of aircraft along said approach line,



illumination means for illuminating the target, and

means subdividing the target into upper and lower zones of different color visible through the stop aperture, the size of the target as viewed by the pilot of an approaching aircraft through the stop aperture, being larger than the size of the stop aperture,

whereby the relative areas of the two colored zones as viewed through the stop aperture vary according to the viewing position along said approach line, indicating to the pilot the position of the aircraft along the said approach line relative to said predetermined ground position.

4,015,236

DEVICE FOR CONTROLLING SAFETY SEAT BELTS

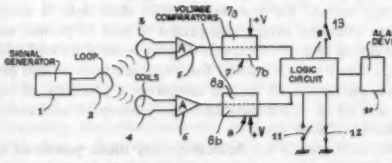
Jean-Claude Boudeville, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Hauts de Seine, France

Filed Jan. 14, 1976, Ser. No. 649,082

Claims priority, application France, Jan. 15, 1975, 75.01077

Int. Cl.² B60R *21/10*

U.S. Cl. 340—52 E **4 Claims**



1. A device for checking and controlling the proper closing and locking of a safety belt of the seat of a vehicle, which comprises an emitter system for emitting electrical oscillations and at least one receiver, position sensing switches for detecting the closure of the belt and the presence of an occupant on the seat, and an alarm system, wherein said emitter system comprises a low-frequency non-radio frequency electromagnetic oscillator, said oscillator being located on the lap portion of the belt strap, said receiver comprises two identical receiving circuits disposed in parallel, each of said two identical receiving circuits includes the series connection of a receiving coil, an amplifier and a double voltage comparator receiving in each comparator a predetermined reference voltage whereby the voltages of the signals representing the highest voltage limit or the lowest voltage limit received on the corresponding coil, are compared, as a function of the position of the oscillator in the emitter system, wherein said coils are located the one under the upholstery of the seat back and the other under the upholstery of the seat bottom respectively, a logic system connected to the outputs of said comparators and to said position sensing switches and said alarm system being connected at the output of said logic system.

4,015,237

VEHICLE ALARM SYSTEM

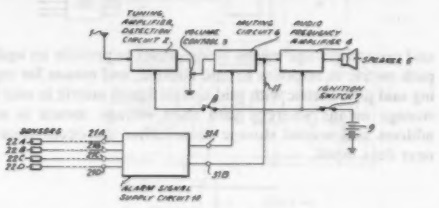
Masayoshi Takatani, and Yuji Amaya, both of Kobe, Japan, assignors to Fujitsu Ten Ltd., Kobe, Japan

Filed June 16, 1976, Ser. No. 696,648

Claims priority, application Japan, June 18, 1975, 50-74757

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **10 Claims**



1. A vehicle alarm system for a vehicle having a plurality of operating parts, a plurality of sensors each monitoring a corresponding operating part and an audio reproduction system including an audio frequency amplifier, said vehicle alarm system comprising

a switching circuit for controlling the supply of audio signals to the audio frequency amplifier of the audio reproduction system of a vehicle; and

an alarm signal supply circuit connected between the sensors and the audio reproduction system of the vehicle for producing an alarm signal when an abnormal condition is detected in an operating part of the vehicle by the corresponding one of the sensors, said switching circuit cutting off the supply of audio signals to the audio frequency amplifier and supplying an alarm signal to said audio frequency amplifier when a sensor provides an abnormal condition signal indicating the occurrence of an abnormal condition in an operating part.

4,015,238

METRIC UPDATER FOR MAXIMUM LIKELIHOOD DECODER

Robert Curtis Davis, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

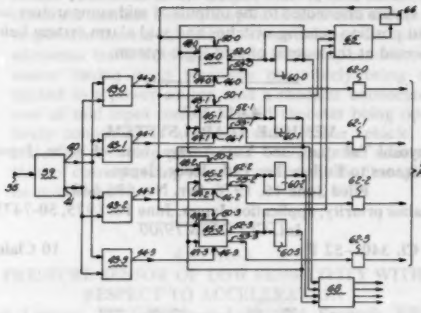
Filed Nov. 24, 1975, Ser. No. 634,904

Int. Cl.² G06F *11/12*

U.S. Cl. 340—146.1 AQ **7 Claims**

1. In a convolutional code decoder for decoding data which coalesces into a predetermined plurality of possible states, said data occurring at branches corresponding to data states in a sequence, and including correlation means having a data input indicative of a message digit comprising received convolutional data and in which branch metrics are utilized to update path metrics and in which magnitudes of survivor path metrics are compared to determine the most likely sequence of received data, the improvement wherein said correlation means comprises a trellis connection computer having a first storage means associated with one possible data state of a received sequence, said first storage means being coupled to be addressed by the data input and being preset to provide an output address indicative of branch metrics associated with

the likelihood of data input entering the state from one data path; second storage means for providing an updated path metric; third storage means for storing a path metric of said data path; means coupling said path metric and said output address to provide addresses to said second storages means;



said second storage means being preset to provide an updated path metric in response to said address, and means for replacing said path metric with said updated path metric in said third storage means whereby said third storage means is set to address said second storage means after the occurrence of a next data input.

4,015,239

CHARACTER RECOGNITION APPARATUS

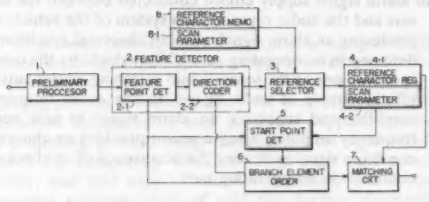
Yoshiji Fujimoto, and Shozo Kadota, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1975, Ser. No. 624,339

Claims priority, application Japan, Oct. 21, 1974, 49-120393

Int. Cl.² G06K 9/12

U.S. Cl. 340—146.3 H **5 Claims**



1. Character recognition apparatus comprising:

a. preliminary processing means for obtaining two dimensional binary information representing an unknown character and for storing such information in matrix form;

b. feature detecting and storage means for detecting terminal points, branch points and line elements of the unknown character from said two dimensional information stored by said preliminary processing means and for providing code signals representing such information;

c. reference character memory means for storing scan parameters particular to each of a plurality of reference characters together with a code train of said reference characters obtained by the use of the associated scan parameters;

d. start point detecting means responsive to said feature detecting and storage means for selecting one of the terminal points of said unknown character as a start point based on the associated scan parameter of a reference character selected from the reference character memory means;

e. processing means for combining code signals representing the line elements stored in said feature detecting and storage means and converting them into a code train on the basis of the start point selected by said start point detecting means; and

f. comparing means for comparing the code train of the unknown character with that of the selected reference character.

4,015,240

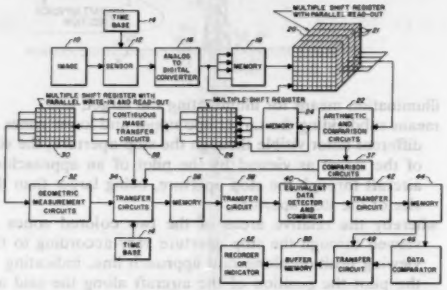
PATTERN RECOGNITION APPARATUS

Claron W. Swonger, Elma; Hollis F. Ryan, Cheektowaga, both of N.Y.; Robert M. Stock, Severna Park, Md., and Charles M. Vossler, Williamsville, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Continuation of Ser. No. 349,349, April 9, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,399

Int. Cl.² G06K 9/12

U.S. Cl. 340—146.3 E **7 Claims**



1. Pattern recognition apparatus enabling the determination of the coordinates and angular positions of characteristic points such as fingerprint minutiae, comprising;

a. sensing means developing a plurality of signals in response to a presented pattern containing characteristic points which are to be identified,

b. conversion means responsive to said signals for converting said pattern into a binary encoded image containing many levels of gray scale data,

c. temporary storage means for temporarily storing in a predetermined sequence portions of said data, which portions comprise sets of points corresponding to said binary encoded image, each point of which having a value indicative of the gray scale level thereof,

d. means for comparing and averaging said data in said storage means for converting said data into a second binary encoded image comprised of sets of points, each containing one of two levels of gray scale data and which image has been corrected for imperfections in said presented pattern, said means comprise a plurality of logic circuits all of which simultaneously compare and average portions of said data,

e. continuity means for detecting only those points of said second binary encoded image that are contiguous to a predetermined set of coordinates in said presented pattern, said means comprise a plurality of continuity logic circuits all of which simultaneously detect contiguous points located in portions of said second binary encoded image whereby the detection of all points therein is simultaneous,

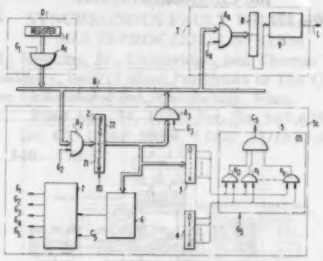
f. means for detecting and determining values indicative of various geometric properties of said contiguous points including the coordinates and angular positions thereof and comparing the same with a plurality of predetermined threshold values, and

g. characteristic point storage means for receiving the coordinate and angular positions of said contiguous points which fall within said threshold values.

4,015,241
INFORMATION PROCESSING SYSTEM

Fumihiko Takezoe, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Feb. 12, 1976, Ser. No. 657,663
Claims priority, application Japan, Feb. 12, 1975, 50-17629
Int. Cl.² H04Q 9/00
U.S. Cl. 340—147 SC 10 Claims



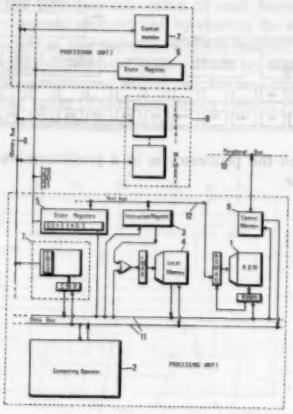
1. In an information processing system of the type having a plurality of widely dispersed stations interconnected in cascade by means of a transmission link for transmitting information between stations, said system further being of the type wherein non-operating stations are by-passed by means of a bypass connection, and wherein each of the stations of said system is of the type which has a controller for controlling the routing of all information in the station and which is capable of transmitting and receiving information words having at least an address part, the improvement comprising means at at least one station for preventing said station from transmitting information words destined for a non-operating station.

4,015,242
DEVICE FOR COUPLING SEVERAL DATA PROCESSING UNITS TO A SINGLE MEMORY

Francois Anceau, Gieres; Claude Beauducel, Franconville; Pierre Courboulay, Paris, and Jacques Cretin, Le Chesnay, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, France

Continuation-in-part of Ser. No. 416,401, Nov. 16, 1973, abandoned. This application Apr. 28, 1976, Ser. No. 681,249
Claims priority, application France, Nov. 29, 1972, 72-42516
Int. Cl.² G06F 15/16
U.S. Cl. 340—172.5 7 Claims

1. In a system comprising a plurality of data processing system units coupled to a central memory and a plurality of peripheral units, each data processing system unit comprising an instruction processing means, means for exchanging data with the peripheral units through at least one data transfer channel and a microprgammed means including means for decoding microinstructions, said microprogrammed means including a first managing system means for controlling the execution of instructions stored in said central memory, a second managing system means for defining a hierarchy between task lists, each task list including tasks of the same type which can be executed only through said means for exchanging data or only through said instruction processing means and for making said instruction processing means available for processing the task heading the priority task list, a third managing system means for storing lists of tasks to be executed and for arranging actuatable tasks of the same type respectively in the corresponding task lists, and means for synchronizing said first, second and third managing system means comprising a first storage means connected with said second and third managing system means for storing a signal from said third managing system means indicating the current state of the task lists and providing an output to said second mangaging system means in accordance therewith, a second storage means connected with said first, second and third managing system means for storing a signal from said third managing system means indicating that an actuatable task takes priority over the currently active task and for providing an output to said first management system means in accordance therewith, and a third storage means connected with said first and second managing system means for storing a signal from said second managing system means indicating the type of task being performed and providing an output to said first management system means in accordance therewith, the improvement



comprising a system coupling means for coupling said data processing system units with each other and with said central memory including a plurality of commutating means connected respectively to an associated data processing system unit, each commutating means having a number of outputs equal to the number of data processing system units, and decoding means for establishing a connection path through said commutating means and being responsive to a signal from said third managing system means of any one of said data processing system units for outputting a signal to said second storage means of a designated one of said data processing system units.

4,015,243
MULTI-PROCESSING COMPUTER SYSTEM

Horst G. Kurpanek, 802 Allison Way, Sunnyvale, Calif. 94087, and Gail P. Cone, 2276 Edsel Drive, Milpitas, Calif. 95035

Filed June 2, 1975, Ser. No. 582,778
Int. Cl.² G06F 15/16
U.S. Cl. 340—172.5 10 Claims

1. A digital communication system for transferring information represented by digital data signals comprising:

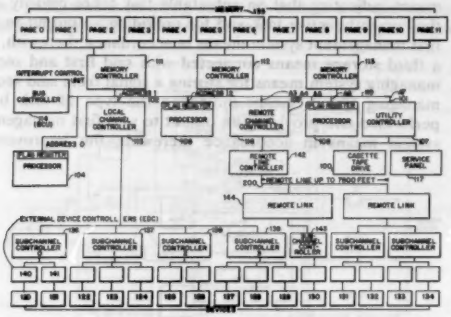
a bus;

a plurality of processors operatively connected to said bus;

at least one channel controller attached to said bus;

bus control means responsively connected to said bus for receiving interrupt signals from one or more controllers

attached to said bus and for determining the state of each of said processors, and for interrupting a given processor

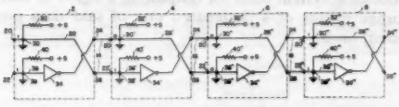


when the processor is in a predetermined interruptable state.

4,015,244
SELECTIVE ADDRESSING SYSTEM

Gary R. Simpson, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1975, Ser. No. 641,247
Int. Cl.² G06F 7/00, 7/06
U.S. Cl. 340—172.5 6 Claims



1. In a data processing system, means for selectively addressing individual ones of a plurality of signal modules comprising:

a plurality of component units each arranged to contain a plurality of signal modules,

said plurality of component units being electrically identical with respect to each other,

each of said component units having an input terminal means and an output terminal means,

each of said component units including means for internally establishing a self-address code at said input terminal means, said self-address code being the same for all of said component units,

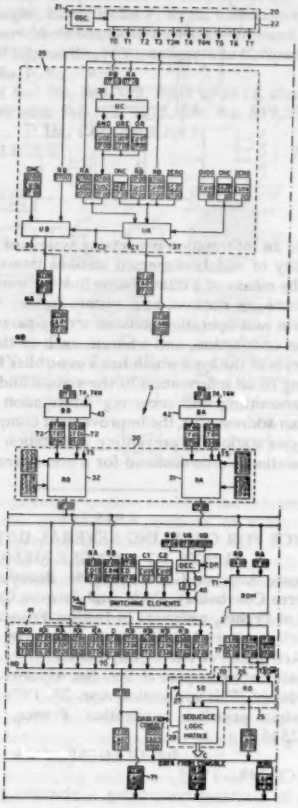
each of said component units further including means for developing at the output terminal means thereof an address code which is different from the address code established at the input terminal means thereof, and

means for so interconnecting said component units that the different address code appearing at the output terminal means of the preceding component unit overrides the self-address code of the succeeding component unit and constitutes the address code for that succeeding component unit whereby to provide a succession of unique address codes for successive component units.

4,015,245
BIPROGRAMMABLE ELECTRONIC ACCOUNTING MACHINE

Luigi Mercurio, Ivrea (Turin), and Piercarlo Ravasio, Calolziocorte (Bergamo), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sept. 2, 1975, Ser. No. 609,803
Claims priority, application Italy, Sept. 2, 1974, 69664/74
Int. Cl.² G06F 9/18, 3/00
U.S. Cl. 340—172.5 5 Claims



1. Biprogrammable electronic accounting system comprising

a single keyboard for introducing information into the system,

a single visual display for visually displaying messages for an operator,

a memory comprising a first and second zone each recording data and instructions relating to a first and a second program respectively,

a processing unit for executing in parallel the instructions of said first and second programs,

control means for conditioning the processing unit to alternately execute either the instructions associated with the first program or the second program, said programs being thereby alternately rendered active or inactive,

a single service console for signalling to said operator a condition requiring said operator's attention in either of said first and second programs running in parallel,

a change-over switch for establishing a signal level having a first value associated with the first program and a second value associated with the second program,

means for storing an indication of the active or inactive status of said first and second programs, and

means for checking said stored indication against the signal values established by the change-over switch for allocating at least one of the keyboard and the visual display and the console selectively to the first or the second program

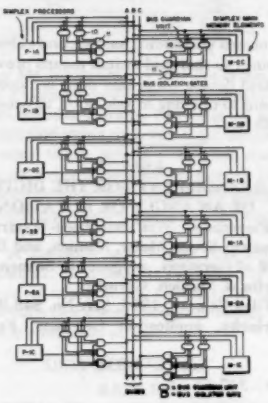
4,015,246
SYNCHRONOUS FAULT TOLERANT MULTI-PROCESSOR SYSTEM

Albert L. Hopkins, Jr., Cambridge, and Thomas Basil Smith, III, Sudbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 14, 1975, Ser. No. 567,629

Int. Cl.² G06F *11/00, 13/00, 15/16, 3/00*

U.S. Cl. 340—172.5 **4 Claims**



1. In a synchronous fault tolerant multi-processor system which includes at least three buses, at least six processors, each processor coupled to each of the buses, at least two redundant bus guardian units for each processor, each bus guardian unit coupled to each of said buses, and a plurality of bus isolation gates, at least three gates coupled to each one of said processors and to said two bus guardian units for each respective processor, each of said three gates per processor coupled to a different one of said buses, said bus guardian units receiving messages only from said buses and providing output signals to control said gates in order to permit or deny transmission of messages from each of said processors to said buses.

4,015,247
METHOD FOR OPERATING CHARGE TRANSFER MEMORY CELLS

Roger T. Baker, Box 240, Mount Tabor, N.J. 07878

Filed Dec. 22, 1975, Ser. No. 642,721

Int. Cl.² G11C *11/40, 7/00*

U.S. Cl. 340—173 R **10 Claims**

1. A method of representing, entering, and storing the value of a binary valued variable in a semiconductor memory cell, comprising the steps of:

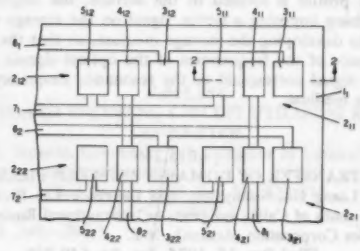
a. utilizing a first electrode in proximity to a semiconducting material to establish for charge carriers of one polarity a first localized minimum potential energy region in said semiconducting material,

b. utilizing a second electrode in proximity to the said semiconducting material to establish for said polarity of charge carriers, a second localized minimum potential energy region in said semiconducting material,

c. representing the first possible value of said binary valued variable in the said memory cell by storing a relatively large number of charge carriers of said polarity in said first localized minimum potential energy region and storing a relatively small number of charge carriers of said polarity in said second localized minimum potential energy region,

d. representing the second possible value of said binary valued variable in the said memory cell by storing a relatively large number of charge carriers of said polarity in said second localized minimum potential energy region and storing a relatively small number of charge carriers of said polarity in said first localized minimum potential energy region,

e. entering the first possible value of said binary valued variable in the said memory cell by altering the number of charge carriers of said polarity stored in said first and said second localized minimum potential energy regions such that the aforementioned conditions for representing the first possible value of the said binary valued variable in said memory cell are established,



f. entering the second possible value of said binary valued variable in said memory cell by altering the number of charge carriers of said polarity stored in said first and said second localized minimum potential energy regions such that the aforementioned conditions for representing the second possible value of the said binary valued variable in said memory cell are established,

g. storing the value of the said binary valued variable so entered in the said memory cell by maintaining said first and said second localized minimum potential energy regions in said semiconducting material and maintaining the ratio of the number of charge carriers of said polarity stored in the said first localized minimum potential energy region to the number of charge carriers of said polarity stored in the said second localized minimum potential energy region at substantially the same value established for said ratio when the said value of the binary valued variable was entered in said memory cell.

4,015,248
PROCESS FOR RECORDING LOW-FREQUENCY WIDE-BAND SIGNALS ON A THERMOPLASTIC STORAGE MEDIUM

Dietlind Pekau, Taufkirchen, and Eckhard Storck, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 521,395, Nov. 6, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,564

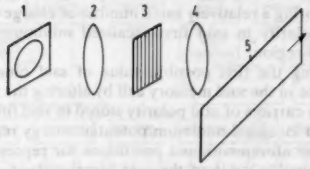
Claims priority, application Germany, Nov. 7, 1973, 2355702

Int. Cl.² G11C *11/46;* **H04N** *5/82;* **G11B** *7/24*

U.S. Cl. 340—173 TP **6 Claims**

1. In a process for recording low-frequency, wide-band signals on a thermoplastic storage medium having a resonance frequency considerably higher than the frequency of the signal being recorded and particularly adapted for recording electrical interference signals of sonar holograms on the storage medium, which process includes providing a thermoplastic storage medium on a transparent photoconducting carrier,

sensitizing the thermoplastic material by applying a charge of uniform distribution to a surface thereof, converting the electrical signals of information to be recorded with an electro-optical transducer into optical signals, exposing the thermoplastic medium with the optical signals to create a charge profile corresponding to the optical signals and developing the exposed storage medium by heating the medium to at least a



softening point so that a surface relief corresponding to the charge profile is formed in the surface, the improvement comprising imposing a lattice signal on the storage medium prior to developing the storage medium, so that the sum or difference of the frequencies of the optical signals and the lattice signal correspond to the resonance frequency of the storage medium.

4,015,249

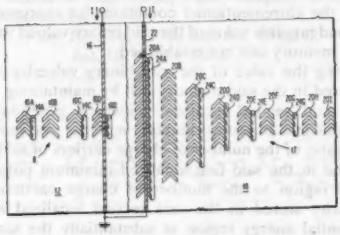
TRANSFER OF DOMAINS BETWEEN FIELDS

Hung Liang Hu, Sunnyvale, and Laurence Lee Rosier, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,356

Int. Cl.² G11C *19/08*

U.S. Cl. 340—174 TF **14 Claims**



1. The combination adapted to move a magnetic domain from an outlet in a first field to a second field comprising

outlet means from a first field,

propagation means in said first field adapted to move a domain in a first direction out of said field through said outlet means,

inlet means to a second field positioned next to said outlet means wherein a domain leaving said outlet means enters said inlet means, and

propagation means in said second field adapted to move a domain in said first direction.

4,015,250

ALARM FOR REMOVAL OF A FIRE EXTINGUISHER

William L. Fudge, Minneapolis, Minn., assignor to Larsen's Manufacturing Company, Minneapolis, Minn.

Filed Sept. 2, 1975, Ser. No. 609,350

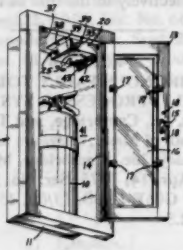
Int. Cl.² G08B *13/08*

U.S. Cl. 340—280 **3 Claims**

1. In combination:

a fire extinguisher mount comprising a first cabinet for containing said fire extinguisher, having a door to be opened to gain access thereto;

an electric module including a second cabinet, a source of electrical energy, an electrically energizable alarm device, and switch means for controlling energization of said device from said source;



and hinge means positioning said second cabinet within said first cabinet so that said switch means prevents energization of said device when said door is closed, but acts, as an incident to opening of said door, to cause energization of said device.

4,015,251

CIRCUIT ARRANGEMENT FOR THE DIGITALIZATION OF AN ANGLE OR ROTATION

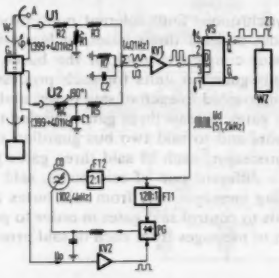
Klaus V. Pieverling, Wolfratshausen-Waldram; Gerhard Klemt, Munich; Bruno Maier, Munich, and Dieter Leypold, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 10, 1975, Ser. No. 548,861

Claims priority, application Germany, Feb. 18, 1974, 2407678

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 SY **17 Claims**

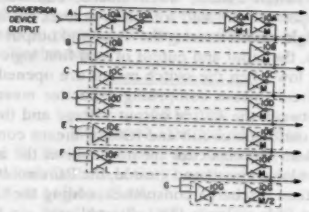


1. In a circuit arrangement for the digitalization of an angle of rotation ϕ of a rotatable device which is operated at *fa* rotations per second, employing auxiliary voltages modulated with the sin ϕ and the cos ϕ of a fundamental frequency *fo*, whereby, due to the modulation, said auxiliary voltages comprise respective mixtures of the frequency component (*fo—fa*), and the frequency component (*fo—fa*), the combination of means for effecting a phase shift of 90° of one of said auxiliary voltages, means for coupling the two auxiliary voltages (U1, U2) following such phase shift, whereby a third auxiliary voltage (U3), having the frequency of only one of said auxiliary frequency components remains, and a D-flip-flop (S), operating as a comparator circuit, to the clock input of which said third auxiliary voltage is supplied in the form of rectangular impulses, and to whose D-inputs a comparison voltage (U*d*) is applied, in the form of rectangular impulses having a frequency of $n \cdot fo$, whereby counter pulse trains (Z1) with a frequency of $n \cdot fa$ appear at the output of the D-flip-flop, in which n corresponds to the angle of rotation equal to ϕ 360° and represents a power of 2.

4,015,252
HIGH SPEED SERIAL DATA SYNCHRONIZATION SCHEME

Jerome J. Symanski, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,005
Int. Cl.² G06F *5/04*
U.S. Cl. 340—347 DD **6 Claims**



1. A device for synchronizing and converting a serial data bit stream to a parallel data format comprising:

a serially connected plurality of strings of active logic devices, each said string of active logic devices introducing a delay equal to the period of one said data bit:

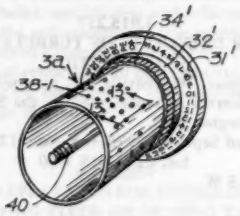
one additional string of active logic devices having an input serially connected to said plurality of strings and an output, introducing a delay less than the period of one said data bit;

a plurality of flip-flops each having data and clock inputs and an output, each data input being connected to one end of one of said plurality of strings of active logic devices and each clock input being connected to said output of said one additional string.

4,015,253
ROTARY DIGITAL CHANNEL SELECTION APPARATUS

Richard Goldstein, Deerfield, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,180
Int. Cl.² G08C *9/06*
U.S. Cl. 340—347 P **10 Claims**

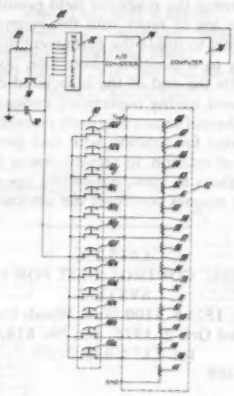


8. Rotary digital encoding apparatus comprising, in combination: a combination knob and encoder unit including a cylindrical light opague encoder drum having circumferentially spaced groups of light-transparent areas thereon, each group of which are axially aligned and permit light to pass through the drum radially to form a light pattern constituting binary coded information representing a distinctive number or other information, and an outer knob portion to be grasped by an operator rotating the combination knob and encoder unit; and a cylindrical drum-receiving housing having an aperture at one end into which said encoder drum passes, the housing having a rear wall with a shaft-receiving bearing thereon; the combination knob and encoder unit having a shaft adapted to engage said bearing when the combination knob and encoder unit is fully inserted within said housing; said housing rear wall supporting light means adapted to pass within the drum when the combination knob and encoder unit is fully inserted within said housing; said combination knob and encoder unit having spaced recesses therein circumferentially spaced in accordance with the spacing of said groups of light-transparent areas on said drum; spring-urged radially extending projecting means adapted releasably to enter one of said recesses so that the combination knob and encoder unit can be adjusted to any one of a number of different angular positions; said housing having a light pattern reading station opposite which the different groups of light-transparent areas on said drum are brought as the combination knob and encoder unit is rotated to said different positions; and light pattern responsive means at said light pattern reading station of said housing for intercepting the light pattern passing through the group of light-transparent areas of the drum opposite the light pattern reading station.

4,015,254
KEYBOARD ENCODING CIRCUIT UTILIZING AN A/D CONVERTER

Earl R. Strandt, Greendale, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 4, 1975, Ser. No. 637,517
Int. Cl.² G06F *3/02*
U.S. Cl. 340—365 S **3 Claims**

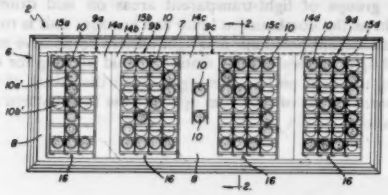


3. A keyboard encoding circuit comprising a plurality of manually actuable keyboard switches, a source of voltage, a plurality of voltage diveder resistors serially connected across said source for establishing a different voltage at each junction between said resistors, means connecting one side of each of said switches with a respective one of said junctions, a capacitor connected with the other side of each of said switches whereby said capacitor is charged to the voltage established at the junction connected with the particular keyboard switch upon closure of the switch, multiplexing means including a plurality of channels one of which is connected with said capacitor, an analog-to-digital converter connected with the output of said multiplexer, computer means responsive to the output of said analog-to-digital converter and providing a clearing signal in response to conversion of any one of said different voltages, semiconductor switch means responsive to said clearing signal for discharging said capacitor.

4,015,255
MAGNETICALLY OPERATED SIGN

Keith S. Wood, Danville, Ill., assignor to Time-O-Matic, Inc., Danville, Ill.

Filed June 25, 1975, Ser. No. 590,322
Int. Cl.² G08B 5/24
U.S. Cl. 340—373 28 Claims

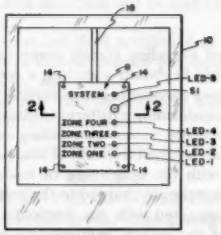


1. A magnetically operated sign comprising: a panel made of a material of low magnetic reluctance, and a plurality of magnetically operated indicating devices carried by the panel, each indicating device comprising a reversibly energizable electromagnet having a core with only a single leg projecting from said panel and a coil around said leg for producing at the end of said core leg when said winding is energized a magnetic field which is of one polarity or the other depending upon the direction of energization of the coil, a permanent magnet confronting each core and having a magnetic axis extending between opposite magnetic poles, means for rotatably mounting said permanent magnet for rotation in a plane transverse to said panel about an axis of rotation which is between the poles thereof and parallel to said panel, the coil of the electromagnet upon momentary energization thereof in one direction or the other causing the magnetic field produced at said one end of the core leg to react with the magnetic field of the permanent magnet to rotate the permanent magnet about said axis of rotation to a position where one pole or the other thereof confronts the end of the associated core leg, and an indicating element having contrasting appearing surfaces on opposite sides thereof secured to each permanent magnet and rotatably mounted for rotation with said permanent magnet about said axis of rotation, to present one or the other of said contrasting surfaces to view, depending upon which pole of said permanent magnet confronts the associated core.

4,015,256
ELECTRONIC CONTROL UNIT FOR INTRUSION SYSTEM

Arnold T. Pratt, 1526 S. 1100 West, Woods Cross, Utah 84087

Filed Oct. 2, 1975, Ser. No. 618,977
Int. Cl.² G01D 21/09
U.S. Cl. 340—409 8 Claims



1. An intrusion alarm system for surveillance of a restricted area comprising:

a source of electrical power having a positive output voltage of relatively small magnitude;

circuitry for delaying the enabling of surveillance of the restricted area which restricted area comprises an exit site, said circuitry comprising first switch means exposed, within the restricted area that actuates said delaying circuitry when manually operated and second switch means at said exit site which are open and closed by egress from said restricted area;

said delaying circuitry further comprising at least first and second logic circuits each comprising integrated circuit components, said logic circuits comprising input and output means;

the second switch means, when closed, communicating electrical power from said source to at least the input of the first logic circuit causing the input and output thereof to be high, the input and output of said first logic circuit becoming low when the switch means are opened;

RC delay circuit means comprising capacitor means connected between the source output voltage and the input to the second logic circuit and resistor means connected in series with the capacitor means between the input to the second logic circuit and ground, the RC circuit means having a time discharge constant exceeding the time for the system user to leave the restricted area via the exit sites;

circuitry means for delaying the issuance of a low output when said circuitry means are implemented by the user immediately prior to the user leaving the restricted area via the exit site which temporarily communicates the source output voltage to the input of the second logic circuit whereby the input and output of said second logic circuit are high;

means connecting the output of the first and second logic circuits to alarm means;

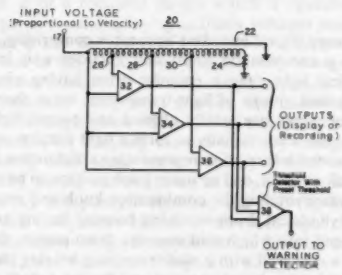
means blocking the communication of a low output of the first logic circuit to the alarm means;

whereby opening of the second switch means by the user leaving the restricted area via the exit site as mentioned will cause the first logic circuit to be low at its input and output which low is blocked by said blocking means and said RC delay circuit means will retain the second logic circuit in a high state for a period of time equal to the time discharge constant during which time said second switch means will again be closed, the first logic circuit becoming high at its input and output and said high being communicating to said alarm means whereby no alarm is issued.

4,015,257
RADAR DETECTION OF TURBULENCE IN PRECIPITATION

Richard W. Fetter, Warrenville, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 11, 1975, Ser. No. 612,384
Int. Cl.² G01S 9/60
U.S. Cl. 343—5 W 4 Claims



1. A method of detecting turbulence within precipitation using an IF portion of a radar system wherein the IF portion has a center frequency comprising:

applying the IF portion of the radar system to a discriminator for detecting frequency variations from the center frequency, which variations are indicative of the velocity of the precipitation;

producing a voltage proportional to said detected frequency variations;

splitting the voltage proportional to the detected frequency variations into a first and second part;

applying said first part to a delay line;

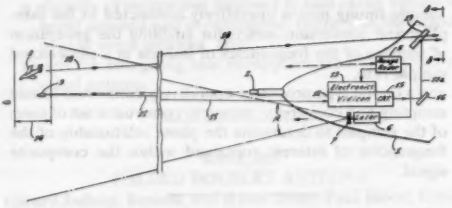
comparing said second part to the delayed first part;

amplifying any amplitude difference between the compared parts to provide a voltage indication of turbulence at a particular range.

4,015,258
WEAPON AIMING SYSTEM

William W. Smith, Palos Verdes Peninsula, and John N. Monroe, Altadena, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 7, 1971, Ser. No. 132,190
Int. Cl.² G01S 9/62
U.S. Cl. 343—6 R **7 Claims**



1. The method of indicating to an aircraft gun operator or the like the real time position of a bullet fired from his gun at a target rapidly changing direction relative to the gun's line of fire, the position indication of the bullet being as the bullet passes through the target range, comprising: determining the range of said target, providing a reflective means on the rear of said bullet, transmitting a diverged pulsed light beam of between about 10° and about 40° conical angle in the general direction of the bullet path, to thus keep the bullet in said beam as the gun's line of fire changes, detecting the reflected light from said bullet, and imaging said reflected light into the line of sight of the gun operator in true relative azimuth and elevation position to a simultaneous indication of the position of said target, said reflected light being admitted to said line of sight only during the time interval when said bullet is substantially at the range of said target.

4,015,259
METHOD AND APPARATUS FOR INTERROGATING AND IDENTIFYING FIXED OR MOVING TARGETS

Ardell V. Siverhus, Neptune; Joseph A. Matava, Belmar, and Dirk R. Klose, Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,658
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.8 LC **10 Claims**

1. An object identification system comprising:

a transponder mounted on an object to be identified;

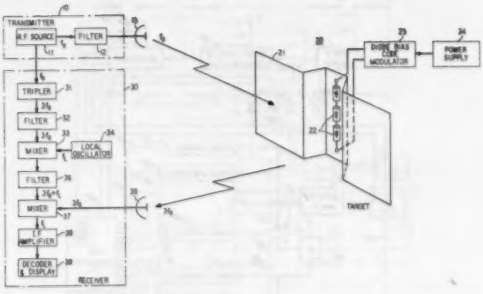
means for interrogating said transponder with a beam of electromagnetic wave energy;

said transponder including at least one non-linear device having an conductive state and a non-conductive state and reradiating a signal back to the means for interrogating in response to impingement upon said device of energy from the means for interrogating, the frequency of said signal being harmonically related to the frequency of said wave energy;

means for modulating the harmonic signal reradiated back towards the interrogating means to identify uniquely the object on which said interrogating means is mounted, said modulating means including

means for generating a repetitive *m*-bit identification code;

means responsive to each bit of said *m*-bit code for generating an *n*-bit pseudo-random code sequence for said each



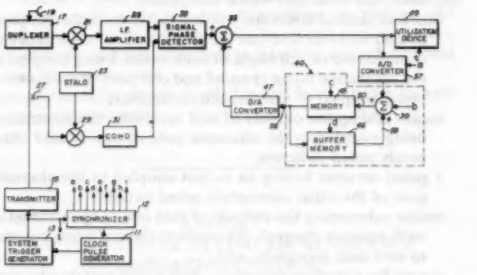
bit corresponding to the instantaneous logical value and relative position of that bit of said identification code; and

means responsive to said pseudo-random code sequence generating means for selectively biasing said at least one non-linear device to either one or the other of said two states $m \times n$ times for each occurrence of said *m*-bit identification code.

4,015,260
DIGITAL MTI RADAR

Ronald B. Campbell, Jr., Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1970, Ser. No. 85,941
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 **5 Claims**



5. In an MTI radar system, the combination comprising:

a. differencing means for producing an analog difference signal corresponding to the difference between a composite video signal produced during a range sweep and an analog signal representative of a prediction of such composite video signal;

b. an analog-to-digital converter for digitizing such analog difference signal;

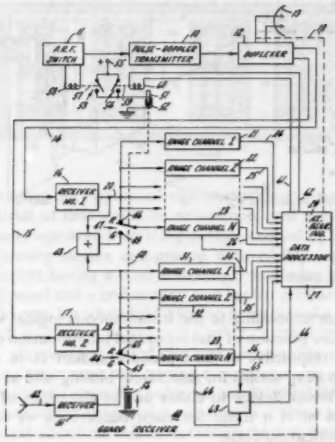
c. predicter means, responsive to the digital signal produced by the analog-to-digital converter, for producing a digital signal representative of a prediction of the composite video signal for a succeeding range sweep; and

d. a digital-to-analog converter for converting the digital signal produced by the predictor means into the analog signal, such analog signal being the analog signal representative of a prediction of the composite video signal which is coupled to the differencing means.

4,015,261
TIME SHARING CIRCUIT FOR GUARD RADAR RECEIVER IN RADAR RANGING SYSTEM

Robert R. Campbell, Towson, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 7, 1964, Ser. No. 336,318
Int. Cl.² G01S 7/36, 9/10, 9/48
U.S. Cl. 343—18 E **8 Claims**



1. A time sharing circuit for a multiple pulse repetition frequency, pulse-Doppler target bearing and ranging radar having dual antenna horns with a receiver and a plurality of range channels coupled in a receiver channel from each antenna horn to a data processor with the plurality of range channels in each receiver channel being in parallel, and having a pulse repetition frequency switching means coupled to control transmission of different pulse repetition frequencies in sequence, the invention which comprises:

first and second alternately poled switches in the coupling of said receiver and one range channel of each receiver channel, the switch blade of each switch being coupled to the respective range channel and one pole of each switch being coupled to the respective receiver;

means adding the outputs of said receivers, the summation being coupled to the alternate pole of one of said alternately poled switches;

a guard receiver having an output coupled to the alternate pole of the other alternately poled switch;

means subtracting the outputs of said one range channel of each receiver channel, the quotient thereof being coupled to said data processor; and

means for actuating said alternately poled switches by control means of said pulse repetition frequency switching means and said data processor to time share alternate switch positions of said alternately poled switches for different pulse repetition frequencies and to maintain said guard receiver in circuit with the respective range channel when target and jamming signals are received.

4,015,262
DIGITAL FILTERS FOR OBTAINING QUADRATURE COMPONENTS OF A PERIODIC SIGNAL

Fred Etcheverry, San Pedro, and Harold Ray Samuelson, Los Angeles, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

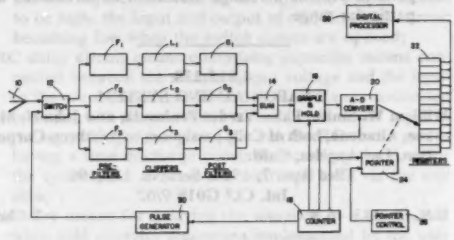
Filed Dec. 30, 1974, Ser. No. 537,245
Int. Cl.² G01S 1/30
U.S. Cl. 343—105 R **13 Claims**

8. An omega type navigation receiver comprising:

a. antenna means for receiving a transmitted composite signal comprised of a plurality of pre-established frequencies of interest which have a common subharmonic frequency,

b. input means operatively connected to said antenna means to receive the transmitted composite signal,

c. sampling and conversion means operatively connected to said input means for receiving the composite signal for sampling portions thereof and generating a digital equivalent thereof at a preselected sample rate,



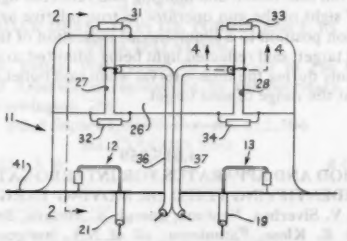
d. sample timing means operatively connected to the sampling and conversion means for enabling the generation of samples of the frequencies of interest at a preselected sample rate,

e. and a digital type processor operatively connected to said sampling and conversion means to construct a set of sums of the samples to determine the phase relationship of the frequencies of interest contained within the composite signal.

4,015,263
DUAL POLARIZED BLADE ANTENNA

John A. Koerner, Belmont; James P. Scherer, Sunnyvale; Donald J. Stoddard, Woodside, and George N. Voronoff, San Francisco, all of Calif., assignors to Textron, Inc., Belmont, Calif.

Filed Feb. 23, 1976, Ser. No. 660,051
Int. Cl.² H01Q 1/28, 13/10
U.S. Cl. 343—708 **6 Claims**



1. An improved dual polarized antenna comprising

a dielectric blade adapted to extend upwardly from a ground plane,

a metal coating upon the upper portion of said blade and having a pair of vertical slots extending completely through said metal to define a pair of slot radiators,

a plurality of resistors connected one across each end of each of said slots,

electrical connections across each of said slots providing horizontally polarized antenna connections,

a pair of vertically polarized antenna elements disposed in said blade between said slots and said ground plane, and

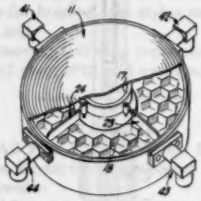
electrical connections to said vertically polarized antenna elements providing vertically polarized antenna connections.

4,015,264

DUAL MODE BROADBAND ANTENNA

John A. Koerner, Belmont, Calif., assignor to Textron, Inc., Belmont, Calif.

Filed Nov. 20, 1975, Ser. No. 633,632
Int. Cl.² H01Q 1/36
U.S. Cl. 343—725 6 Claims



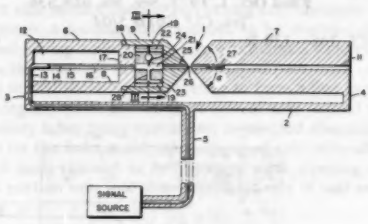
1. A dual mode broadband antenna comprising
a spiral antenna
means defining a cavity having an open end across which said spiral antenna is disposed,
electrical connections to said spiral antenna,
a plurality of monopoles disposed in said cavity behind said spiral antenna and in orthogonal relation to the windings of said spiral antenna, and
means for energizing said monopoles separately from said spiral antenna.

4,015,265

FOLDED DOUBLET ANTENNA

Gérard Dubost, Rennes, and Henri Albert Paul Havot, Cesson-Sevigne, both of France, assignors to Etat Francais, France

Filed July 8, 1975, Ser. No. 593,957
Claims priority, application France, July 18, 1974, 74.24951
Int. Cl.² H01Q 9/26
U.S. Cl. 343—747 7 Claims



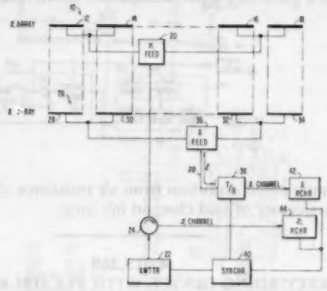
1. A folded doublet antenna comprising:
first and second substantially cylindrical members, each having a frusto-conical end portion;
a third substantially cylindrical member coupled to the ends of said first and second members distant from said frusto-conical end portions for supporting said first and second members axially spaced from each other with their respective frusto-conical end portions facing each other;
a coaxial conductor having an inner conductor extending through a bore in said first member and into a facing bore in said second member, said inner conductor terminating within and electrically insulated from said second member;
means for supplying signals to said coaxial conductor, the wavelength of said signals having a desired relationship to a dimension of said antenna; and
impedance compensation circuit means mounted in one of said first and second members and interposed in said coaxial conductor for compensating the impedance of said doublet antenna alone.

4,015,266

RADAR DIPOLE ANTENNA ARRAY

John Borowick, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1976, Ser. No. 664,340
Int. Cl.² G01S 9/22
U.S. Cl. 343—815 10 Claims



1. In a microwave antenna system, the improvement comprising, in combination:
a pair of dipole antenna arrays mutually arranged so that one of said pair of arrays is adapted to operate as a passive array for the other during a transmit mode but as an independent active array during a receive mode;
respective RF feed networks coupled to said pair of arrays;
RF transmitter means including coupling means coupled to the feed network for said other antenna array during said transmit mode for transmitting RF signals therefrom;
first receiver means coupled to said coupling means and being responsive to signals received at said other array during said receive mode;
means coupled to said feed network for said one antenna array, being operable during said transmit mode to reflect a short circuit at said one antenna array which thereby acts as a passive array, said means being operable during said receive mode, however, to translate signals from said feed network for said one array to second receiver means whereby said one array acts as an active array during said receive mode; and
second receiver means coupled to said feed network for said one antenna array.

4,015,267

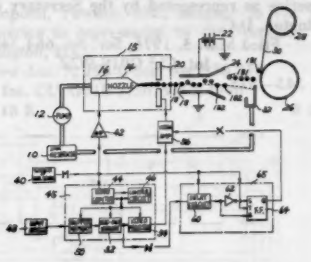
INK JET PRINTER HAVING AIR RESISTANCE DISTORTION CONTROL

Takeshi Kasubuchi, Nara; Kaoru Ozawa, Yamatokoriyama, and Tomoo Makita, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 19, 1973, Ser. No. 380,571
Int. Cl.² G01D 18/00
U.S. Cl. 346—1 15 Claims

1. A method obviating air resistance distortion of ink drop trajectories in an ink drop recording system wherein character signals are applied to ink drop charging means for applying a charge of predetermined amplitude to selected ones of a plurality of ink drops travelling in a stream to constrain predetermined trajectories on said charged ink drops, said method comprising the steps of:
sensing the presence of one or more uncharged ink drops immediately preceeding the next ink drop to be charged to anticipate air resistance distortion of the trajectory of said next ink drop to be charged; and
adjusting the amplitude of the charge to be applied to said

next ink drop to be charged as a function of the presence of one or more of said uncharged ink drops to obviate the



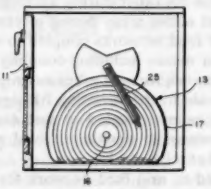
anticipated distortion from air resistance of the resulting trajectory of said charged ink drop.

4,015,268

RECORDING DEVICE WITH FLEXIBLE CHART

Austin S. Norcross, Waban, Mass., assignor to Norcross Corporation, Newton, Mass.

Filed Mar. 15, 1976, Ser. No. 666,791
Int. Cl.² G01D *15/34*
U.S. Cl. 346—137 **6 Claims**



1. A recording device comprising
a chart;
means for rotating said chart so that a first major portion of said chart containing the central portion thereof rotates substantially in a first plane and a second lesser portion thereof rotates substantially in a second plane which is angularly disposed with respect to said first plane;
recording means coacting with said chart during rotation thereof for placing recorded information on said major portion of said chart, said recording means being in contact with said major portion of said chart so that recordal occurs on said chart in said first plane; and
means for enclosing said chart, said rotating means and said recording means, the inner surface of one side of said enclosing means being adjacent said portion of said chart and forming means for retaining said lesser portion in place during the rotation of said chart.

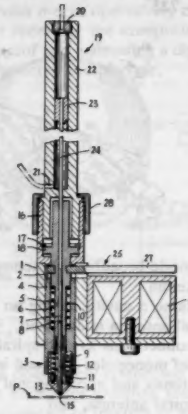
4,015,269

AUTOMATIC PENCIL APPARATUS FOR AN AUTOMATED DRAFTING SYSTEM

Tsukasa Edo, Narashino, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 17, 1975, Ser. No. 596,606
Claims priority, application Japan, July 26, 1974, 49-85896
Int. Cl.² G01D *15/24*
U.S. Cl. 346—139 C **6 Claims**

1. An automatic pencil apparatus for use with an automated drafting system comprising: gripping means for gripping and releasing a lead during use of the apparatus, said gripping means including an actuatable collet slidably receiving therethrough the lead and operable when actuated to release the lead and when not actuated to releasably grip the lead, and means for normally biasing said collet to its non-actuated state; driving means for selectively driving said gripping means to thereby automatically actuate said collet to effect release of the lead; and pressing means for exerting a constant pressure on the lead while it is released from said collet to thereby press



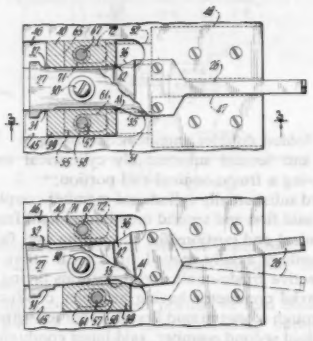
the lead into contact with a drafting paper under constant pressure, said pressing means including a slidably mounted rod having one end in contact with the lead, and means for applying constant pressure to the other end of said rod so that said rod presses the lead under constant pressure into contact with the drafting paper.

4,015,270

SHOCK PROOF EVENT RECORDER

Vernon M. Barnes, Jr.; Norman E. Flournoy, and Eugene B. Horton, Jr., all of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,536
Int. Cl.² G01D *5/04*
U.S. Cl. 346—139 R **9 Claims**



1. In combination with an event recorder which may be subjected to high acceleration shocks during operation thereof,
stylus means for indicating said event upon actuation thereof,

said stylus means being pivoted to be movable from a locked position to at least one event actuated position,
locking means for holding said stylus means to prevent inadvertent actuation thereof, and
means for actuating said stylus means upon happening of an event, comprising
means for concurrently unlocking and actuating said stylus means which comprises
stop means for holding said stylus means in said locked position, and
means for moving said stop means to release said stylus means and pivot it to said event actuated position.

4,015,271

PRINTING HEAD FOR USE WITH AN INK JET PRINTER

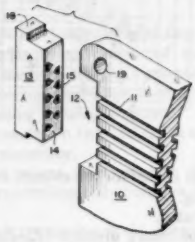
Stig Bertil Sultan, Floda, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Feb. 11, 1976, Ser. No. 657,037

Claims priority, application Sweden, July 23, 1975, 75083865

Int. Cl.² G01D *15/18*; **B05B** *1/20*

U.S. Cl. 346—140 R **2 Claims**



1. A printing head for an ink jet printer having a plate-shaped part with two large oppositely located front and back surfaces, a plurality of spaced ink transport channels in each surface, said plate-shaped part being provided with a recess in one short side surface thereof and having said channels opening thereinto, a second plate adapted to be inserted in said recess and having a plurality of spaced channels which correspond to the channels in said plate-shaped part, each of said channels in said second plate tapering to form a fine capillary tube having an outlet at one short side of said second plate, said capillary tubes being operatively connected alternately to channels on the front and back surfaces of said plate-shaped part, and each channel in said second plate opening at its broadest portion only into the other short side of said second plate.

4,015,272

INK EJECTION TYPE WRITING UNIT

Kiyoshi Yamamori; Masayoshi Miura, and Akira Mizoguchi, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

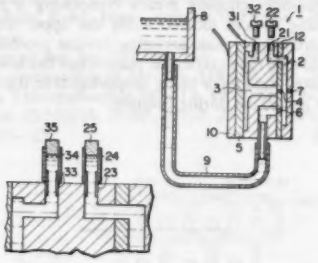
Filed Aug. 7, 1975, Ser. No. 602,914

Claims priority, application Japan, Aug. 14, 1974, 49-93711

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **2 Claims**

1. In an arrangement for applying liquid droplets to a surface comprising, a liquid-applying unit including a housing with a front wall facing a surface to which the unit is to apply a liquid, a chamber having an intake channel connected to a liquid supply container and a discharge channel in said front wall through which the liquid is discharged from the chamber into the atmosphere, pressure-producing means for producing short duration pressure increases in the liquid in the chamber, the chamber having means dividing the chamber into an outer chamber portion adjacent to the discharge channel and an inner chamber portion, a connecting channel in the dividing means connecting outer and inner chamber portions, the connecting channel being axially aligned with the discharge channel and the intake channel being in communication with the outer chamber portion, the inner chamber portion having a larger diameter portion in contact with the pressure-producing means and a smaller diameter portion adjacent to the connecting channel, the improvement comprising: means defining a first vent passageway for connecting the outer chamber portion to the atmosphere; means defining a second



vent passageway connecting the larger diameter portion of said inner chamber portion to the atmosphere; first and second transparent tubes connected at one end to the first and second vent passageways, respectively, and extending outwardly of the liquid applying unit; and first and second closure means removably attached to the other end of the first and second tubes, respectively, so that bubbles in the liquid in the outer and inner chamber portions are collected in the tubes and visible from externally thereof.

4,015,273

TYPE CARRIERS

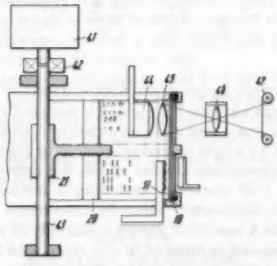
Hans Linde, and Horst Maecker, both of Berlin, Germany, assignors to H. Berthold A.G., Germany

Filed Apr. 21, 1975, Ser. No. 569,956

Claims priority, application Germany, May 15, 1974, 2423952

Int. Cl.² B41B *17/32*; **G03B** *17/06*

U.S. Cl. 354—15 **5 Claims**



1. A type symbol selecting device designed to be used in photocomposing machines, said device comprising:
a plurality of identical type carriers with different groups of type symbols and/or code information, each of said type carriers comprising a thin sheet of elastic material, sur-

rounded by a protective edge and having a deformable cylindrical segment shape and a normal flat storable shape;

a cylindrical holder-carrier comprising a cylindrical body and a centrally situated disk;

means releasably clipping several of said type carriers to said holder-carrier on a peripheral surface of said cylindrical body such that said attached type carriers are sequentially located next to each other and are uniformly distributed around said peripheral surface of said holder-carrier, said type carriers being separated from each other by a plurality of support struts on said central disk;

a guidance groove located on said disk, said type carriers being inserted into said guidance groove; and

said releasably clipping means comprising a plurality of arresting devices located along the upper edge of said cylindrical body, said arresting devices providing a force to hold said type carriers in place when the holder-carrier is rotated, said force being proportional to the centrifugal force generated during rotation.

4,015,274

MEMORY DEVICE OF AN ELECTRICAL SHUTTER FOR SINGLE LENS REFLEX CAMERA

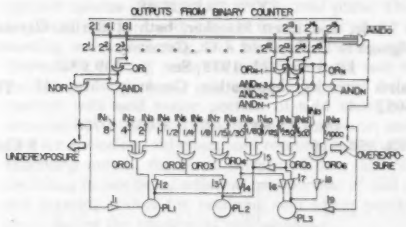
Akira Takahashi, Tokyo, and Masamichi Furukawa, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 414,643, Nov. 12, 1973, abandoned. This application July 7, 1975, Ser. No. 593,295

Claims priority, application Japan, Nov. 13, 1972, 47-113649; Nov. 13, 1972, 47-113650

Int. Cl.² G03B *7/00, 7/08, 17/20*

U.S. Cl. 354—23 D **7 Claims**



1. In a memory device of an electrical shutter for single lens reflex cameras wherein light which is transmitted through the taking lens is measured and converted into an electric photometric value by a light receiving element to provide an indication of an appropriate shutter speed, the improvement comprising: an A-D converter including a memory means for storing said photometric value by conversion into a digital quantity; a D-A converter having a plurality of storage means, which correspond in number to one more than the number of manually settable shutter speeds, for receiving the output of said memory means and producing an output indicative of an appropriate shutter speed; three illuminating elements, each producing light of a different color; and means for receiving said indicative output and lighting only said three illuminating elements in six different combinations respectively indicative of the appropriate shutter speed.

4,015,275

DIGITAL TIMER FOR A PHOTOGRAPHIC CAMERA SHUTTER

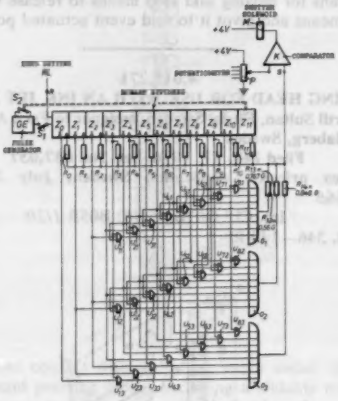
Walter Bietz, Braunfels, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Feb. 19, 1975, Ser. No. 551,136

Claims priority, application Germany, Feb. 25, 1974, 2408908

Int. Cl.² G03B *7/08*

U.S. Cl. 354—23 D **4 Claims**



1. A digital timer circuit for the electric control of a camera shutter, comprising:

a. a pulse generator;

b. a sequence of binary dividers (Z_0–Z_{10}) connected with said pulse generator;

c. a resistor (R_0–R_{10}) connected to each of said binary dividers, each of said resistors having the same conductance and all resistors together performing a digital to analog conversion;

d. a comparator having a first input and a second input; all resistors (R_0–R_{11}) being connected to said first input, the electrical potential of which corresponds to the number of said binary dividers having "1" state, and thus corresponding to the logarithm of the shutter time to be obtained, which shutter times differ from one another by powers of 2 in the reference timing series;

e. means for generating a predetermined electrical potential, said means being connected to said second comparator input; and

f. a solenoid connected to the output of said comparator, said solenoid actuating said camera shutter when said comparator output carries a signal as a consequence of the potential of said first comparator input reaching said predetermined potential of said second comparator input.

4,015,276

ELECTRIC SHUTTER OPERATING CIRCUITS FOR USE IN PHOTOGRAPHIC CAMERAS

Masaru Yamamoto, Machida, Japan, assignor to Yashica Co., Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,328

Claims priority, application Japan, Sept. 13, 1973, 48-102657; Sept. 13, 1973, 48-102658

Int. Cl.² G03B *7/00, 7/08*

U.S. Cl. 354—37 **5 Claims**

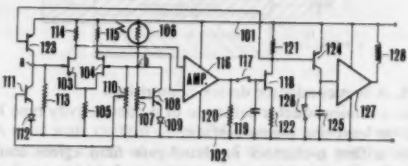
1. An electric shutter operating circuit for use in a photographic camera comprising:

a photoelectric element for generating an electric signal corresponding to the brightness of an object to be photographed;

a first potentiometer which is set in accordance with the iris

opening of the camera and a second potentiometer connected parallel with said first potentiometer which is set in accordance with the photosensitivity of photographic film used;

a high input impedance comparator circuit for comparing signals from said first and second potentiometers, said comparator circuit including a first field effect transistor with its gate connected to said first potentiometer and said photoelectric element and a second field effect transistor with its gate inter-connected to the gate of said first field effect transistor through a transistor which is controlled from said second potentiometer in accordance with the setting representing said photosensitivity of film



used, the drain electrodes of said first and second field effect transistors being connected via an operational amplifier to a memory capacitor connected on the output side of said comparator circuit to store an electric quantity corresponding to said brightness;

an amplifier connected to respond to the terminal voltage of said memory capacitor;

operating circuit means responsive to the output of said amplifier for controlling the operation of a shutter of said camera; and

a feedback circuit responsive to the output from said amplifier for feeding back a feedback signal to said gate of said second field effect transistor.

4,015,277

SHUTTER DEVICE FOR A CAMERA

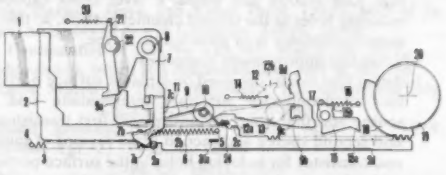
Mutsunobu Yazaki; Noriaki Sanada, both of Yokohama, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,395

Claims priority, application Japan, June 25, 1974, 49-72655; Aug. 25, 1974, 49-96496

Int. Cl.² G03B 17/42

U.S. Cl. 354—206 **3 Claims**



1. A shutter charging device for a camera using a film providing one perforation per one frame, comprising a shutter including a shutter driving spring, a film winding mechanism, means for charging said shutter driving spring, operation means operatively engageable with said means for charging said shutter driving spring and said film winding mechanism for effecting at the same time the operation of said film winding mechanism and the charging of said shutter driving spring, said operation means including a set plate movably displaceable through an operating stroke, an operation lever movably mounted on said set plate, said operation lever having a part engageable with said means for charging said shutter driving spring, a spring extending between and connected to said set plate and said operation lever so that said operation lever is moved by said set plate during the operating stroke thereof and engages with said means for charging said shutter driving spring for effecting the charging of said shutter driving spring, a fixed stopping member located in the path of said operation lever for engagement therewith after said set plate completes a predetermined portion of the operating stroke so that said stopping member disengages said operation lever from said means for charging said shutter driving spring while said said plate continues the remainder of the operating stroke for completing the film winding operation.

4,015,278

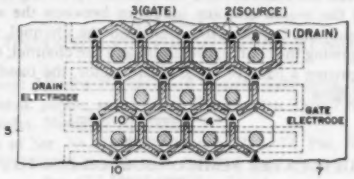
FIELD EFFECT SEMICONDUCTOR DEVICE

Masumi Fukuta, Kobe, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 527,208, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 318,629, Dec. 26, 1972, abandoned. This application May 13, 1976, Ser. No. 686,250

Int. Cl.² H01L 29/80, 27/02, 27/10, 29/06

U.S. Cl. 357—22 **14 Claims**



1. A field effect semiconductor device having source and drain regions and a gate region, comprising:

a semiconductor substrate of high resistivity material, the resistivity thereof substantially being that of an insulator, and having first and second opposite main surfaces,

a layer of semiconductor material of a given conductivity type disposed on said first main surface,

said layer of semiconductor material being formed to include a reduced thickness portion of a desired polygonal configuration defining said gate region and said gate region surrounding and thereby defining a portion of said first layer of corresponding polygonal configuration comprising a first region of said semiconductor layer, and the remaining portion of said layer surrounding said polygonal gate region comprising a second region of said semiconductor layer,

said gate region thereby being elongated and surrounding and isolating said first region from said second region and defining a conducting path extending parallel to said first main surface of said substrate between said first and second regions of said semiconductor layer,

first and second electrodes in ohmic contact with said first and second regions and a gate electrode in rectifying contact with said gate region, and

means for applying voltages to said first and second electrodes to selectively operate one of said first and second regions as the source and the other thereof as the drain of said transistor and to said gate electrode to control the conductivity of the current channel between said source and drain regions.

4,015,279

EDGELESS TRANSISTOR

William Edward Ham, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

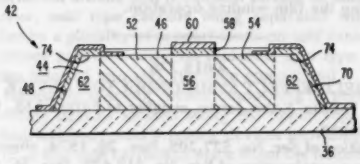
Filed May 27, 1975, Ser. No. 581,042

Int. Cl.² H01L 27/12, 29/78

U.S. Cl. 357—23 **10 Claims**

1. A transistor comprising a semiconductor mesa with a

principal surface, the surface having a region thereunder, sidewalls surrounding the region, a source, a drain, a channel consisting of the semiconductor between the source and the drain, separating the source from the drain, said source and said drain being portions of said region containing doping in addition to the doping in the remainder of said region, a dielectric on the principal surface adjacent the channel, a gate electrode spaced above the channel by the dielectric, and a



portion of the mesa undoped by source and drain additional doping containing only impurities of a single type located between the sidewalls and the region, separating the sidewalls from the region and any junctions between the source and channel and between the drain and the channel, the region comprising the source, the drain, and the channel, the portion comprising a band of the semiconductor, the band encircling the region.

4,015,280

MULTI-LAYER SEMICONDUCTOR PHOTOVOLTAIC DEVICE

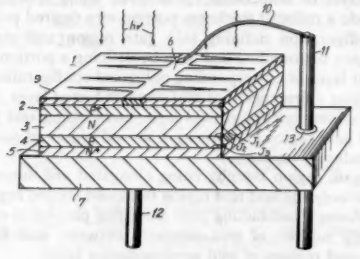
Takeshi Matsushita, Sagamihara, and Takayoshi Mamine, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,500

Claims priority, application Japan, Oct. 19, 1974, 49-120616

Int. Cl.² H01L *31/04*

U.S. Cl. 357—30 **18 Claims**



1. A semiconductor photovoltaic device comprised of **2n** contiguous stacked regions of semiconductor material arranged so that successive regions are of alternating conductivity type material, wherein n is an integer greater than one, the outer regions being of opposite conductivity type material and each inner region having a thickness less than the diffusion length of a minority carrier therein, said contiguous regions defining **(2n-1)**PN junctions, respectively, therebetween, said regions being excited by incident light that successively traverses each said region in said stack to cause charge carriers to be produced, said outer regions collecting charge carriers of opposite polarity, and each respective outer region cooperating with the next succeeding two inner regions to support transistor action to urge majority charge carriers in an inner region to traverse at least two junctions toward said respective outer region, whereby said photovoltaic device functions as a source of electrical energy to supply current from said outer regions to a load.

4,015,281

MIS-FETS ISOLATED ON COMMON SUBSTRATE

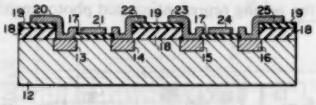
Minoru Nagata, Kodaira; Toshiaki Masuhara, Tokorozawa; Masaharu Kubo, and Norikazu Hashimoto, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 5, 1971, Ser. No. 121,375

Claims priority, application Japan, Mar. 30, 1970, 45-26023; Mar. 30, 1970, 45-26024

Int. Cl.² H01L *27/02*

U.S. Cl. 357—41 **4 Claims**



1. A semiconductor device comprising:

a. a semiconductor substrate of p-conductivity type having at least one planar surface;

b. a first n-channel insulated-gate field effect transistor disposed on the planar surface of said semiconductor substrate, and having spaced first source and first drain regions of n-conductivity type in the surface of said substrate, a first channel portion of said substrate intermediate said first source and first drain regions, a first gate insulator layer on said first channel portion and a first gate electrode on said first gate insulator layer, the first gate insulator layer being of a film which has a thickness less than 2000 A and is selected from the group consisting of an SiO_2 film and a composite film of an SiO_2 layer and a phosphosilicate glass layer, so that said first transistor is of depletion type; and

c. a second n-channel insulated-gate field effect transistor disposed on the planar surface of said semiconductor substrate in spaced relation from said first transistor, said second transistor having spaced second source and second drain regions of n-conductivity type in the surface of said substrate, a second channel portion of said substrate intermediate said second source and second drain regions, a second gate insulator layer on said second channel portion and a second gate electrode on said second gate insulator layer, the second gate insulator layer including a first film which has a thickness less 2000 A and is selected from the group consisting of an SiO_2 film and a composite film of an SiO_2 layer and a phosphosilicate glass layer and a second film Al_2O_3 which has an effective oxide thickness one-half to five times that of said first film, said second gate insulator layer being capable of inducing holes in the second channel portion, so that said second transistor is of enhancement type;

wherein the improvement comprises

isolating film means disposed on a planar surface portion of said semiconductor substrate intermediate said first source and first drain regions of said first transistor and said second source and second drain regions of said second transistor for inducing holes in the surface portion of said substrate, the total effective oxide thickness of said isolating film means being more than two times that of the second gate insulator layer of said second transistor, thereby electrically isolating said first insulated-gate field effect transistor from said second insulated-gate field effect transistor, in which said isolating film means comprises a first film disposed on the surface portion of said substrate and selected from the group consisting of a film of Al_2O_3 and a film of silicon dioxide formed through thermal decomposition of tetraethoxy silane and a second film disposed on the first film and selected from the group consisting of a film of SiO_2 and a double-layer film consisting of a layer of SiO_2 and a layer of phosphosilicate glass.

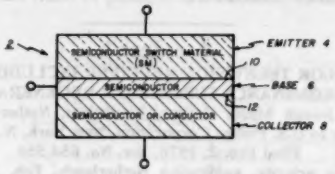
4,015,282
SOLID STATE AMPLIFIER DEVICE AND CIRCUIT THEREFOR

Melvin P. Shaw, Southfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 354,687, April 26, 1973, abandoned. This application Mar. 5, 1976, Ser. No. 664,260

Int. Cl.² H01L *45/00*

U.S. Cl. 357—2 **19 Claims**



1. A solid state current control device comprising: contiguous interfacing layers of material of alternating conductivity type to form one of a pnp and npn device transistor-like device with emitter, base and collector layer with transistor junctions at their interfaces in the order named, terminal-forming layers for making electrical connection to the emitter and collector layers and terminal means for making electrical connection to said base layer, at least one of the emitter and collector layers being made of a switch material which, when a voltage above a given threshold value is applied to opposite sides thereof, switches from a relatively non-conductive state to a relatively conductive state which is of an opposite conductivity type to that of the base layer at least in the conductive state thereof, substantially decreases from the threshold value when a finite resistance is connected in series therewith, the collector layer being of a material which collects electrical charge carriers directed thereto through the base layer, and said base layer always being of sufficiently high resistance not to short circuit the junction between it and the adjacent layers and being of a thinness to be less than the diffusion length of electrical charge carriers therethrough so the majority carriers of the emitter layer are not substantially neutralized or trapped before reaching the junction between the base and collector layers.

4,015,283
HIGH SPEED ELEMENT OF AN INTEGRATED CIRCUIT WITH A MAJORITY CARRIER JUNCTION HAVING A LARGE CURRENT CAPABILITY

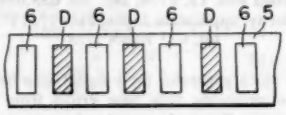
Yutaka Hayashi, Hoya, and Yasuo Tarui, Tokyo, both of Japan, assignors to Kogyo Gijutsuin, Tokyo, Japan

Continuation of Ser. No. 125,789, March 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 809,654, March 24, 1969, abandoned. This application July 25, 1975, Ser. No. 599,083

Claims priority, application Japan, Mar. 25, 1968, 43-18984; Apr. 21, 1968, 43-12973

Int. Cl.² H01L *29/48*

U.S. Cl. 357—15 **6 Claims**



1. An element of an integrated circuit comprising a semiconductor body having emitter, base and collector regions of a transistor with collector-base and base-emitter P-N junctions and a majority carrier junction formed on one surface of said body, said one surface further having an insulating layer thereon; said collector region comprising first and second spacedapart surface portions, said first surface portion being disposed laterally to one side of said base region at said one surface of said body and said second surface portion being continuous with said first portion in said body and disposed laterally to the opposite side of said base region at said one surface of said body, said base region separating said collector region into said first surface portion and said second surface portion at said one surface of said body, said base region being surrounded by said collector region in said body; said majority carrier junction being formed through an opening in said insulating layer by an electrode on said first surface portion of said collector region, an electrode ohmically contacting said base region through an opening in said insulating layer, a collector electrode being formed on said second surface portion of said collector region, an electrical conductor means providing electrical connections to said majority junction, base, collector and emitter electrodes and further effecting a continuous connection of said majority carrier junction electrode and said base electrode, whereby load current capability is improved without increasing storage time of said transistor.

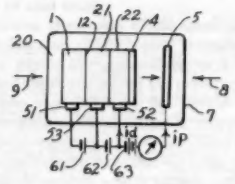
4,015,284
SEMICONDUCTOR PHOTOELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 455,231, March 27, 1974, Pat. No. 3,953,880. This application Jan. 9, 1976, Ser. No. 647,761

Int. Cl.² H01L *29/161, 27/14*

U.S. Cl. 357—16 **9 Claims**



1. A semiconductor photoelectron emission device comprising a p-type GaSb which is a direct transition type semiconductor, a layer of an intrinsic $Ga_{1-x}Al_xSb$, wherein x is less than 1, a p-type $Ga_{1-y}Al_ySb$ layer, wherein y is less than x and larger than 0.4 which is a crossover point x_c, an alkali metal or alkali metal-oxygen activation layer on the opposite side of said $Ga_{1-y}Al_ySb$ layer, and means for applying a bias voltage to junctions between said GaSb and $Ga_{1-x}Al_xSb$, and between $Ga_{1-x}Al_xSb$ and $Ga_{1-y}Al_ySb$.

4,015,285
METHOD OF RECORDING TELEVISION SIGNALS ON A DATA CARRIER AND A RECORDING OBTAINED BY SAID METHOD

René Romeas, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jan. 9, 1975, Ser. No. 539,625

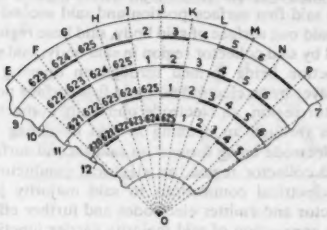
Claims priority, application France, Jan. 11, 1974, 74.01033

Int. Cl.² H04N *5/76*

U.S. Cl. 358—4 **12 Claims**

1. A method of recording a color television signal at the surface of a rotatable data carrier, said signal comprising a sequence of items respectively carrying video information pertaining to the successive scan lines of a television image, said sequence having alternate lines with alternate color

phase, said method comprising the steps of: rotating said record carrier at uniform speed; recording said items in the form of a track made of successive turns lying in said surface; splitting each said turns into N successive equal sections of a revolution of said data carrier, and respectively storing said sequence of items within said successive equal sections; two

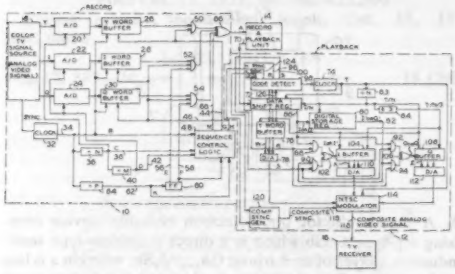


items of said sequence stored along immediately adjacent turns and located within one of said successive equal sections being separated from one another by an odd number of intermediate items; N being an even integer differing by an integer from the number of said scan lines in one frame of said color television signal; said uniform speed being adjusted for making said items register with said equal sections.

4,015,286
DIGITAL COLOR TELEVISION SYSTEM

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,361
Int. Cl.² H04N 5/86, 9/34
U.S. Cl. 358—13 14 Claims



1. A digital color television system comprising: input means for supplying a digital video color television line signal including a luminance signal component and two different chrominance signal components, said input means including a plurality of digital storage means for storing said digital line signal components so that said two chrominance components are each stored in different storage means;

gate means connected to the outputs of said plurality of storage means, and including control logic means for selectively transmitting said television line signal components through said gate means so that altered digital television line signals are produced at the output of the gate means which each include a luminance component and only one of said two chrominance components with said two chrominance components alternating in successive television line signals;

said gate means causing chrominance component words and corresponding luminance component words to be provided in the altered digital line signal at positions adjacent each other, each of said words being shorter than one television line, so that successive luminance words in the same television line are separated by the chrominance words in an alternating manner;

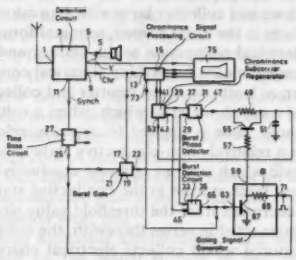
digital delay means for delaying the chrominance components of the altered digital television line signals to produce delayed digital chrominance components at the output of said delay means; and

output means for combining the delayed chrominance components with components of said altered line signals to produce a television line signal output including a luminance component and two different chrominance components at least one of which was obtained from an altered line signal other than that from which its luminance component was obtained.

4,015,287
COLOR TELEVISION RECEIVER INCLUDING A CHROMINANCE SUBCARRIER REGENERATOR

Paulus Joseph Maria Hovens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,556
Claims priority, application Netherlands, Feb. 25, 1975, 7502200
Int. Cl.² H04N 9/44
U.S. Cl. 358—17 1 Claim



1. A colour television receiver including a chrominance subcarrier regenerator having a phase control circuit comprising a filter having a resistor and a capacitor incorporated between an output of a burst phase detector and a control signal input of the regenerator, the time constant of said filter being switchable by means of an output signal from a burst detection circuit, characterized in that a transistor is arranged in parallel with at least part of the resistor, the base of said transistor being coupled to an output of a gating signal generator, an input of said gating singal generator being coupled to an output of the burst detection circuit and a further input being coupled to an output of a pulse generator so that in a non-synchronised state of the regenerator a gating singal occurs at the base of the transistor resulting in the said part of the resistor being substantially shunted by the transistor during the occurrence of the burst.

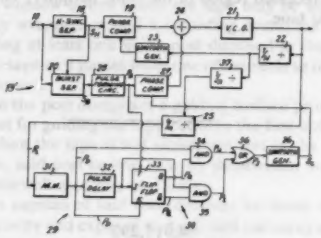
4,015,288
WRITE CLOCK GENERATOR FOR DIGITAL TIME BASE CORRECTOR

Norio Ebihara, and Mitsushige Tatami, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,087
Claims priority, application Japan, Feb. 17, 1975, 50-19597
Int. Cl.² H04N 1/28
U.S. Cl. 358—19 9 Claims

1. A write clock generator for a digital time base corrector employed for removing time base errors from information signals containing first and second reference signals respectively having different standard frequencies and which may have varying time relations to each other; said write clock generator comprising a voltage controlled oscillator for producing a write clock pulse with a center frequency which is a first multiple of the standard frequency of said first reference signal and a second multiple of the standard frequency of said

second reference signal, first and second dividers receiving said write clock pulse and dividing the latter by said first and second multiples, respectively, for providing first and second divided outputs, first and second separators for separating said first and second reference signals, respectively, from the information signals, first phase comparing means receiving the separated first reference signal and said first divided output for producing a first control voltage corresponding to the phase difference therebetween, signal generating means receiving said second divided output and producing at least first and second trains of pulses at the frequency of said second



divided output and having different phases from each other, signal selecting means responsive to the separated second reference signal for selecting the one of said trains of pulses which is substantially out of phase in respect to said separated second reference signal, second phase comparing means receiving said separated second reference signal and the selected one of said trains of pulses for producing a second control voltage corresponding to the phase difference therebetween, and means for combining said first and second control voltages so as to control said voltage controlled oscillator therewith.

4,015,289

VIDEO DISC RECORDING AND/OR REPRODUCING APPARATUS WITH A SINGLE TRANSDUCER HEAD

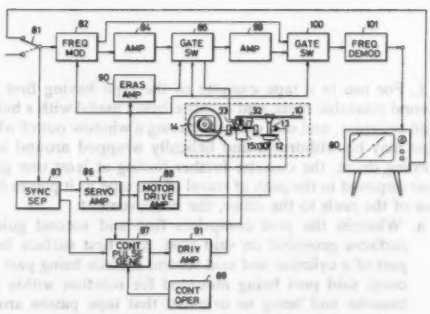
Hisao Kinjo; Fumio Akuwa, and Yasuo Haneji, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 423,677, Dec. 11, 1973, abandoned. This application June 20, 1975, Ser. No. 588,769

Claims priority, application Japan, Dec. 12, 1972, 47-124600; Dec. 12, 1972, 47-124601; Dec. 29, 1972, 48-1540; Dec. 30, 1972, 48-3198

Int. Cl.² H04N *5/795*; **G11B** *21/08*

U.S. Cl. 360—11 **4 Claims**



1. A recording and/or reproducing apparatus comprising a rotating disc recording medium having a recording surface;

means for rotating said medium at a predetermined speed and in synchronization with synchronizing signals supplied thereto during the recording and reproducing modes;

single signal transducing head means for recording and reproducing on said surface an input video signal including cyclically recurring vertical blanking periods, said video signals being recorded in each of a plurality of concentric tracks, each with a successive field recorded thereon;

single step driving means operated responsive to each of said synchronizing signals and each of said vertical blanking periods for intermittently moving said single signal transducing head means step-by-step, said driving means moving said single signal transducing head means from an outer periphery toward an inner periphery of said medium, stopping at each track in a first set of concentric tracks, said driving means reversing the moving direction of the single signal transducing head means responsive to its reaching a given circular track at said inner periphery, and said driving means thereafter intermittently moving the single signal transducing head means step-by-step from the inner periphery toward the outer periphery of the medium, said single signal transducing head means stopping at each track in a second set of concentric tracks, each of said second set of tracks being located midway between corresponding ones of the first set of concentric tracks, said driving means again reversing the moving direction of the single signal transducing head means responsive to its reaching a given circular track at said outer periphery, said single signal transducing head means being moved only in each of said vertical blanking periods;

means effective after each of the steps and during recording for applying said video signals to said single signal transducing head means, said video signal being applied to said single transducing head means by said signal applying means with one complete field being recorded as a unit on each of said tracks;

means effective after each of the steps during reproducing for stepping said single signal transducing head means during a period corresponding to a vertical blanking period and for reproducing the previously recorded video information signal during the period when said single signal transducing head means is stopped;

gate means for removing from the video signal reproduced by said single signal transducing head means that part of each field of signals which substantially corresponds to the period during which said single signal transducing head means steps and for passing the remaining part of said video signal;

means for generating a new vertical synchronizing signal responsive to synchronizing signals continuously supplied from an outside source, said new vertical synchronizing signal corresponding to the vertical synchronizing signal of said video signal reproduced by said signal transducing head means; and

means for inserting the new vertical synchronizing signal into a part of the reproduced video signal which has passed through the gate means in each field of said video signal.

4,015,290

LOW POWER RECORDING INSTRUMENT WITH TWO OR MORE TRACKS

Jack R. Bowers, Petersburg, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

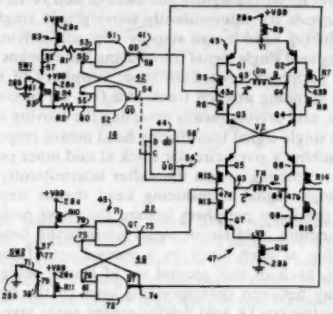
Filed July 31, 1975, Ser. No. 600,871

Int. Cl.² G11B *5/02*, *5/44*

U.S. Cl. 360—63 **15 Claims**

1. In a recording device including a plurality of recording heads for data recording purposes, a recorder circuit for controlling the energization of said recording heads comprising a plurality of switching circuits, each of which has an input terminal and an output terminal and each of which includes

switching means operable to a first state to connect an associated one of said recording heads to its input and output terminals to provide current flow over said recording head in a first direction and operable to a second state to connect the associated recording head to its input and output terminals to provide current flow over said head in a second direction, said plurality of switching circuits being connected in series to enable the switching means for said plurality of switching



circuits to provide a series circuit path including said plurality of recording heads between a first terminal of one of said switching circuits and a second terminal of another one of said switching circuits, and means for connecting said first and second terminals to respective first and second outputs of a current source to provide current flow over each of said heads in said series circuit path with the direction of current flow over each head being determined by the state of the switching means for such head.

4,015,291

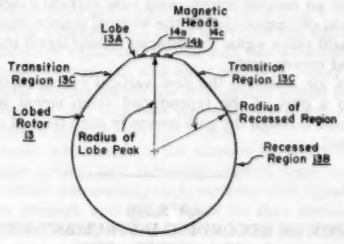
FLYING HEAD HELICAL SCAN MAGNETIC RECORDING DEVICE EMPLOYING A LOBED ROTOR

Peter Alan Stevenson, and Stephen Martin Vogel, both of Boulder, Colo., assignors to International Business Machines Corporation, New York, N.Y.

Filed Sept. 3, 1975, Ser. No. 609,915

Int. Cl.[2] G11B *5/60, 21/20, 15/64*

U.S. Cl. 360—102 **9 Claims**



1. In a helical scan magnetic recording device of the type comprising a tape source; a mandrel having a cylinder axis for supporting a helical wrap of magnetic tape at a substantially constant radial distance from said axis; a rotor positioned along said axis at a location radially within said helical wrap of tape for carrying about said axis at least one magnetic head in scanning adjacency to said tape along a path which is slanted with respect to the length of said tape; means for generating an air bearing for supporting said tape above said rotor; and a tape sink, the improvement wherein said rotor has a periphery characterized by:

a. at least one lobe peak comprising a circumferential region of maximum radial displacement from said axis extending radially beyond the mandrel surface for carrying at least one mandrel head; and

b. a recessed circumferential region which is recessed radially inwardly towards said axis by a distance sufficient to substantially preclude aerodynamic interaction between the recessed region of the rotor periphery and said magnetic tape.

4,015,292

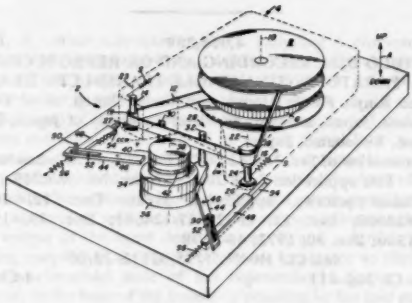
ROTATABLE MULTIFACETED TAPE GUIDE FOR USE IN A CASSETTE

Thomas G. Kirn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,995

Int. Cl.[2] G11B *23/04, 5/52, 15/66*

U.S. Cl. 360—130 **12 Claims**



1. For use in a tape cassette of the type having first and second rotatable reels, said cassette being useful with a helical scan recorder, and said cassette having a window out of which tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement:

a. Wherein the post comprises first and second guiding surfaces provided on said post, said first surface being part of a cylinder and said second surface being part of a cone, said post being mounted for rotation within said cassette and being so oriented that tape passes around said second surface when the tape is not withdrawn out of the cassette window; and

b. wherein said cassette includes means for rotating the first surface of said post into guiding contact with said tape when said tape is withdrawn through the cassette window.

4,015,293

CUTAWAY TAPE GUIDE FOR SELECTIVELY COOPERATING WITH A CAPSTAN AND GUIDING A TAPE

Douglass L. Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

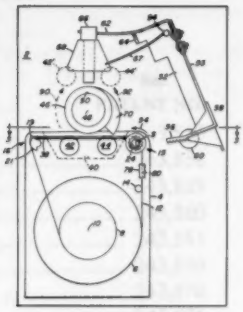
Filed Aug. 22, 1975, Ser. No. 607,001
Int. Cl.[2] G11B *23/04, 15/66, 5/52*
U.S. Cl. 360—130 11 Claims

1. For use in a cassette of the type adapted for cooperation with a helical scan recorder having a rotatable capstan for driving a tape, the cassette having first and second coaxial reels and a window out of which the tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement:

a. wherein the post comprises a guiding surface provided on said post for guiding the tape between the first and second reels when the tape is not withdrawn out of the cassette window, said post having a cavity therewithin and a cut-away sidewall exposing said cavity,

whereby the capstan of said recorder may be freely received within said cavity and exposed through said cut-away sidewall; and

b. wherein said cassette includes means for rotating said guiding surface of said post away from guiding contact with the tape and for presenting said cut-away sidewall to the tape,



whereby said tape may ride against the capstan disposed within said post cavity.

DESIGN PATENTS

GRANTED MARCH 29, 1977

ERRATA

For CLASS	See PATENT NO.
023–163	243,856
013–010	243,858
013–010	243,859
014–005	243,860
014–068	243,861
011–145	243,869
011–026	243,870
015–147	243,881
024–007	243,882
024–033	243,885
028–007	243,886
008–351	243,887
028–049	243,890

DESIGN PATENTS

GRANTED MARCH 30, 1977

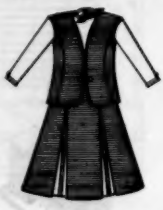
ERRATA

For CLASS	See PATENT NO.
023–163	243,859
012–010	243,858
018–010	243,859
014–005	243,860
014–068	243,861
011–145	243,869
071–026	243,870
015–147	243,881
024–027	243,882
024–033	243,883
028–007	243,886
008–331	243,887
028–049	243,890

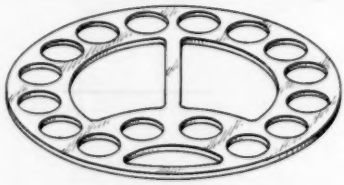
DESIGNS

MARCH 29, 1977

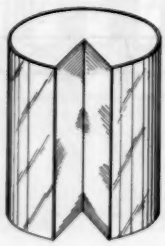
243,801
DRESS ENSEMBLE
Jerrine Bourne Wilson, P.O. Box 155, Petal, Miss. 39465
Filed Jan. 8, 1975, Ser. No. 539,548
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—125



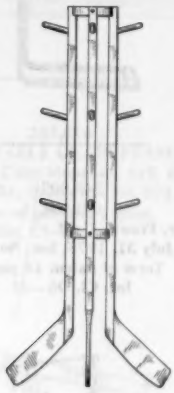
243,802
YARN HOLDER
Sylvia L. Samet, 910 Parkwood Circle, P.O. Box 2012, High Point, N.C. 27261
Filed Sept. 8, 1975, Ser. No. 611,184
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 R



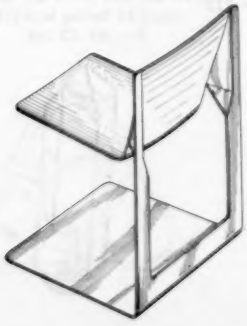
243,803
TABLE
Janet Schwietzer, New York, N.Y., assignor to The Pace Collection Inc., New York, N.Y.
Filed Jan. 23, 1975, Ser. No. 543,373
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27



243,804
GARMENT RACK
Ray L. Underwood, 921 Schuyler St., Milford, Mich. 48042, and Herbert Eschendal, 4400-6 Elizabeth Lake Road, Pontiac, Mich. 48054
Filed Aug. 11, 1975, Ser. No. 603,691
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—29



243,805
CHAIR
Eric Laroye, Koningstraat 14, Bus 2, Oostende, Belgium
Filed June 12, 1975, Ser. No. 586,340
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

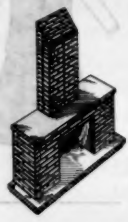


243,806
CHAIR
Ernesto Radaelli, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy
Filed Mar. 18, 1975, Ser. No. 559,446
Claims priority, application Italy, Sept. 19, 1974, 60917/74
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

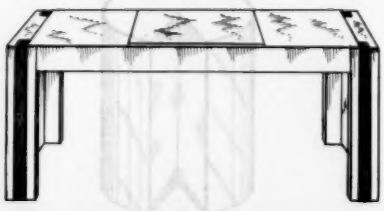
243,807
CHAIR
Alvin Earl Palmer, Fresno, Calif.
Filed July 31, 1975, Ser. No. 600,716
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

243,808
HANGING CONTAINER FOR POTTED PLANTS
Richard K. Helm, P.O. Box 287, Polson, Mont. 59860
Filed Nov. 19, 1975, Ser. No. 633,269
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113

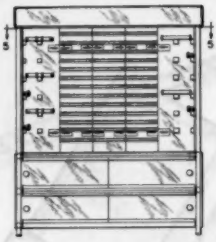
243,809
BAR OR SIMILAR ARTICLE
Hal Hendrixson, 11645 Logan St., Denver, Colo. 80233
Filed Dec. 18, 1974, Ser. No. 534,081
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

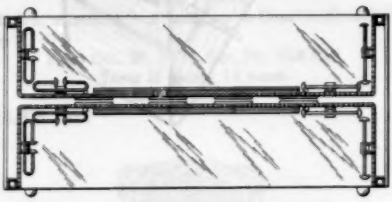


243,810
TABLE
Vittorio Introini, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy
Filed Mar. 18, 1975, Ser. No. 559,449
Claims priority, application Italy, Sept. 19, 1974, 60920/74; Sept. 19, 1974, 60919/74; Sept. 19, 1974, 60923/74; Sept. 19, 1974, 60924/74
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



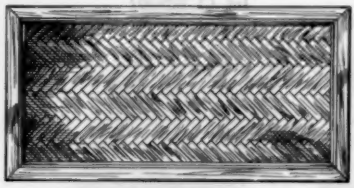
243,811
JEWELRY DISPLAY CABINET
Gerry Hansen, Glen Ridge, N.Y., assignor to Richton International Corporation
Filed Nov. 17, 1975, Ser. No. 632,711
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—172





243,812
CREDENZA
Marion Pratt, 1027 Eastchester, High Point, N.C. 27260
Filed June 13, 1975, Ser. No. 586,559
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—172

243,813
TABLE
Marion Pratt, 1027 E. Chester Drive, High Point, N.C. 27260
Filed Dec. 9, 1975, Ser. No. 640,232
Term of patent 3½ years
Int. Cl. D6—*03*
U.S. Cl. D6—177



243,814
ADJUSTABLE CHAIR FRAME
Jose Figueras Mitjans, Calle Muntaner 515, Barcelona, Spain
Filed Apr. 24, 1975, Ser. No. 571,356
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

243,815
WARDROBE SYSTEMIZER DEVICE
Franklin H. Henry, 1431 Prentice Drive, Healdsburg, Calif. 95448
Filed Dec. 22, 1975, Ser. No. 642,725
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—257

243,816

BEVERAGE GLASS OR SIMILAR ARTICLE

Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 424,354, Dec. 13, 1973. This application Feb. 24, 1975, Ser. No. 552,374

The portion of the term of this patent subsequent to Sept. 30, 1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—15

243,817

DRINKING STRAW

Robert K. Cloyd, 1309 Middleneck Drive, Apt. F, Salisbury, Md. 21801

Filed May 21, 1975, Ser. No. 579,586

Term of patent 14 years

Int. Cl. D7—*06*

U.S. Cl. D7—42

243,818

GREEN BEAN AND PEA SHELLER

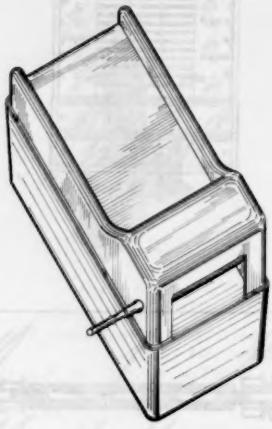
Charles E. Bottcher, Redbud Road, Oneonta, Ala. 35121

Filed July 9, 1975, Ser. No. 594,215

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—153



243,819

CAN OPENER

Donald Lee Avise, Kansas City; David Edgar Keepper, Lee's Summit, both of Mo., and Lewis Aaron Mendelson, Overland Park, Kans., assignors to Dazey Products Company, Kansas City, Mo.

Filed Jan. 7, 1976, Ser. No. 647,052

Term of patent 14 years

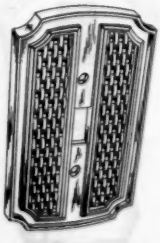
Int. Cl. D7—*99*

U.S. Cl. D8—36

243,820
EXTENSION ARM FOR A VISE
Ronald Price Hickman, Waltham Abbey, England, assignor to Hickman Designs Limited
Filed Dec. 3, 1975, Ser. No. 637,158
Claims priority, application Canada, Oct. 9, 1975, 0910752
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74

243,821
WALL PLATE
Joan Grieb, Westfield, N.J., assignor to General Electric Company
Filed Oct. 20, 1975, Ser. No. 624,085
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350

243,822
WALLPLATE
Joan Grieb, Westfield, N.J., assignor to General Electric Company
Filed Sept. 16, 1975, Ser. No. 613,826
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351



243,823
WALL PLATE
Joan Grieb, Westfield, N.J., assignor to General Electric Company
Filed Oct. 20, 1975, Ser. No. 624,073
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351

243,824
WALL PLATE
Leonard Fine, Brooklyn, N.Y., assignor to General Electric Company
Filed Oct. 20, 1975, Ser. No. 624,077
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—353

243,825
WALL PLATE-BUTCHER BLOCK
Monte L. Levin, New York, N.Y., assignor to General Electric Company
Filed Oct. 20, 1975, Ser. No. 624,034
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351

243,826

BOTTLE OR SIMILAR ARTICLE

Wayne R. Hutter, and John Andrew Miller, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1975, Ser. No. 608,861

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—53

243,827

BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,764

The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—149

243,828

BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,765

The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—149

243,829

BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,766

The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.

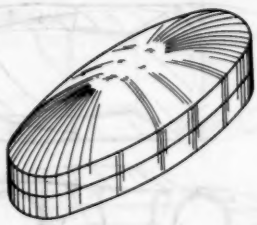
Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—149

243,830
CLEANING COMPOSITION CONTAINER
David A. Jones, Dayton, and Philip R. Goyert, Cincinnati, both of Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Nov. 11, 1975, Ser. No. 630,824
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

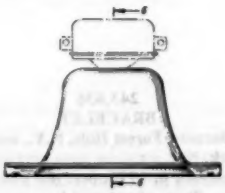
243,831
COMPARTMENTED CONTAINER
Russell Frederick Lehn, Lake County, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 16, 1975, Ser. No. 541,682
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

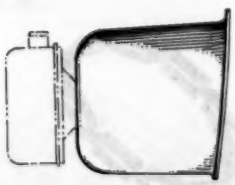


243,832
COMBINED CUP AND TOKEN OR THE LIKE
Andrew P. Shveda, New Canaan, Conn., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 1, 1974, Ser. No. 519,819
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

243,833
END CLOSURE FOR A CONTAINER
Herman Rupert Markert, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Dec. 11, 1975, Ser. No. 639,785
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

243,834
SIREN HORN HOUSING
Harry A. Leeder, Skaneateles, N.Y., assignor to R. E. Dietz Company, Syracuse, N.Y.
Filed June 23, 1975, Ser. No. 589,249
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



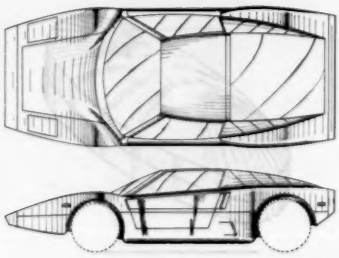


243,835
HEIGHT MEASURING DEVICE
William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Bridgeview, Ill.
Filed Aug. 13, 1975, Ser. No. 604,359
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

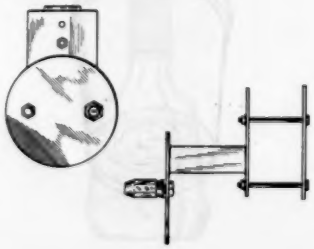
243,836
BRACELET
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Oct. 6, 1975, Ser. No. 620,067
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—12

243,837
DUCTED FAN AIRCRAFT
James T. Adams, 320 Murray Drive, Apt. A, King of Prussia, Pa. 19406
Filed Mar. 25, 1976, Ser. No. 670,144
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—79

243,838
AUTOMOBILE BODY
Lewis G. Peterson, 137 W. 80th St., New York, N.Y. 10024
Filed Dec. 1, 1975, Ser. No. 636,559
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

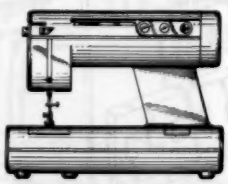


243,839
SPARE TIRE MOUNT FOR TRAILERS
James A. Driscoll, 1219 Garfield, Sand Springs, Okla. 74063
Filed Oct. 14, 1975, Ser. No. 622,100
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—202

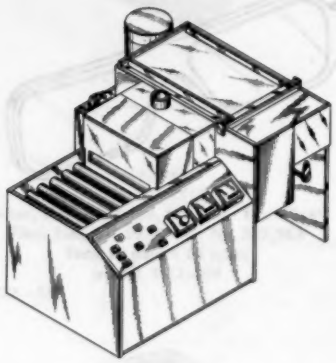


243,840
VISOR FOR VEHICLES OR THE LIKE
Rickey W. Gafnea, 1643 Cherry Ave., Long Beach, Calif. 90813
Filed June 30, 1975, Ser. No. 591,849
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

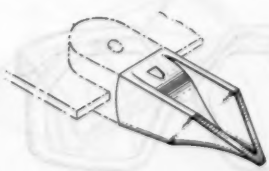
243,841
SEWING MACHINE
Tibor Arvai, Paris, France, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Chofu, Japan
Filed Aug. 25, 1975, Ser. No. 607,813
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



243,842
SPRAY ETCHER FOR WORK PIECES IN WHICH THE WORK PIECES FIRST MOVE INTO THE ETCHER IN ONE DIRECTION AND THEN LEAVE THE ETCHER IN A REVERSE DIRECTION
Burke Leon, Phoenix; Victor Johansen, Tempe; Peter Rose, Phoenix, and Gary Rolih, Tempe, all of Ariz., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.
Filed Oct. 20, 1975, Ser. No. 623,742
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

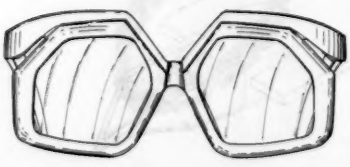


243,843
TOOTH FOR POWER DIGGER
Gerald D. Edwards, Rte. 1, Box 15-A, Dubberly, La. 71024
Filed Aug. 13, 1975, Ser. No. 604,476
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—29

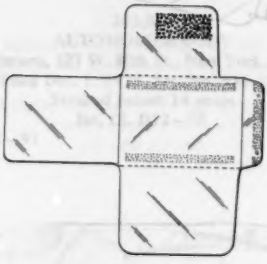


243,844
PAIR OF EYEGLASSES
Elinor B. Petschnikoff, Newport Beach, Calif., assignor to Beverly L. Ricono, a part interest
Filed Nov. 24, 1975, Ser. No. 634,937
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—64

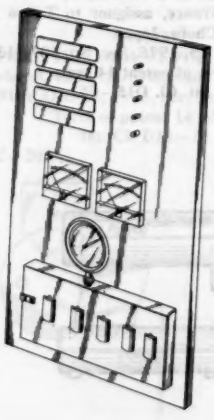
243,845
EYEGLASS FRAME
Elfriede Teufelhart, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed Oct. 21, 1975, Ser. No. 624,326
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



243,846
ENVELOPE
Charles S. Watson, Glen Ridge, N.J., assignor to Berlin & Jones Company, Inc., East Rutherford, N.J.
Filed May 12, 1975, Ser. No. 576,552
The portion of the term of this patent subsequent to Jan. 27, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—3

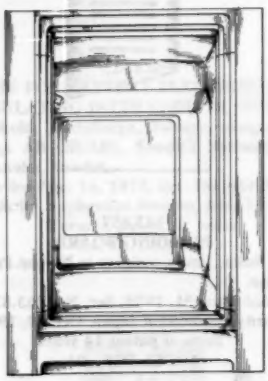


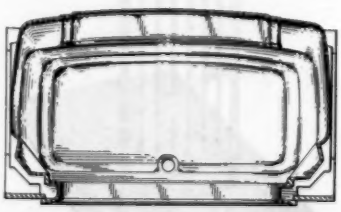
243,847
BATTERY COMPARATOR EDUCATIONAL BOARD
Jack N. Holcomb, P.O. Box 23130, Fort Lauderdale, Fla. 33307
Filed Oct. 15, 1974, Ser. No. 514,896
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



243,848
CIGAR-SHAPED FISHING LURE
Benjamin W. Price, P.O. Drawer 16875, Jacksonville, Fla. 32216
Filed Mar. 15, 1976, Ser. No. 666,927
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

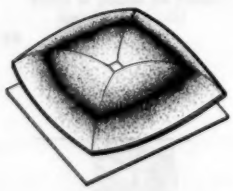
243,849
COMBINATION BATHTUB AND SHOWER STALL
Merritt W. Seymour, Sylvania, and David D. Tompkins, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Oct. 6, 1975, Ser. No. 620,485
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



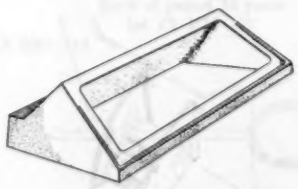


243,850
DISPENSER FOR A TOILET BOWL DISINFECTANT
Richard L. Davenport, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed June 11, 1976, Ser. No. 695,235
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

243,851
VENTILATOR
John V. Felter, P.O. Box 7464, Houston, Tex. 77008
Filed June 11, 1975, Ser. No. 585,964
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153

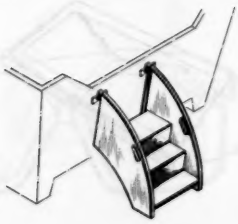


243,852
CHIMNEY COWL
Roger Ouimet, 164 Bellevue Street, Sherbrooke, Quebec, and Clermont Lessard, R.R. No. 1, St-Elie d'Orford, Quebec, both of Canada
Filed July 21, 1975, Ser. No. 597,881
Claims priority, application Canada, Feb. 11, 1975, 1102754
Term of patent 14 years
Int. Cl. D23—*04*, *01*
U.S. Cl. D23—154

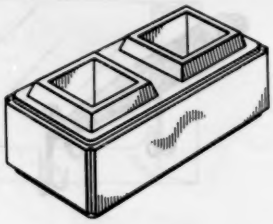


243,853
ROOF SCREEN SUPPORT SYSTEM
Olgierd Z. Ejchorszt, 5580 Vesuvian Walk, Long Beach, Calif. 90803
Filed June 9, 1975, Ser. No. 585,090
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—43

243,854
BOAT STEPS
Donald A. Pelkey, 8665 Elm Ave., Orangevale, Calif. 95662
Filed Nov. 28, 1975, Ser. No. 635,961
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63

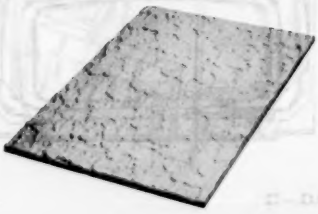


243,855
BUILDING BRICK
Paul Thomas Hynes, 9 Trevor St., Ulverstone, Tasmania, Australia
Filed Apr. 3, 1975, Ser. No. 564,840
Claims priority, application Australia, Oct. 7, 1974, 65833/74
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87



243,856
ACCESSORY COVER FOR PROTECTING AN AIR CONDITIONER FROM SOLAR RADIATION
George J. Panek, 1401 E. San Miguel, Phoenix, Ariz. 85014
Filed Oct. 6, 1975, Ser. No. 619,581
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

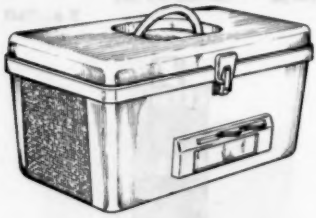
243,857
BUILDING BOARD
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 31, 1975, Ser. No. 563,835
Claims priority, application Japan, Oct. 29, 1974, 49-37674
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



243,858
FRAME FOR BATTERY ELECTRODES
Leif Erik Skold, Akersberga, Sweden, assignor to Svenska Utvecklings AB (SUAB), Swedish National Development Co., Stockholm, Sweden
Filed Dec. 16, 1975, Ser. No. 641,306
Claims priority, application Sweden, June 18, 1975, 751257
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10

243,859
FRAME FOR BATTERY ELECTRODES WITH INSULATING INTERMEDIATE SUPPORT
Leif Erik Skold, Akersberga, Sweden, assignor to Svenska Utvecklings AB (SUAB), Swedish National Development Co., Stockholm, Sweden
Filed Dec. 16, 1975, Ser. No. 641,360
Claims priority, application Sweden, June 18, 1975, 751258
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10

243,860
PORTABLE STEREO TAPE PLAYER
Peyton G. Simpson, Jr., 5618 Melshire, Dallas, Tex. 75230
Filed May 29, 1975, Ser. No. 581,895
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—5



243,861
TRANSCEIVER
Toshimasa Akazawa, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 4, 1976, Ser. No. 711,669
Claims priority, application Japan, Feb. 10, 1976, 51-514061
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

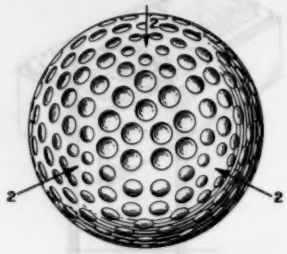
243,862
FIREPLACE MATCH HOLDER
Donald R. Phares, 510 1/2 Larkspur Ave., Corona del Mar, Calif. 92625
Filed July 7, 1975, Ser. No. 593,884
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—32

243,863
COVER FOR CIGARETTE LIGHTER
Hans Lowenthal, London, England, assignor to Colibri Lighters Ltd., London, England
Filed Dec. 12, 1975, Ser. No. 640,160
Claims priority, application United Kingdom, July 4, 1975, 971730/75
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

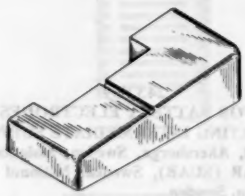
243,864
PIG FEEDER
Julius C. Becker, Downs, Kans., assignor to Becker Manufacturing Company, Incorporated, Downs, Kans.
Filed Apr. 19, 1976, Ser. No. 678,226
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

243,865
GAME TARGET
Stanley Laut, 1253 E. 73rd St., New York, N.Y. 10021
Filed Sept. 15, 1975, Ser. No. 613,440
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP

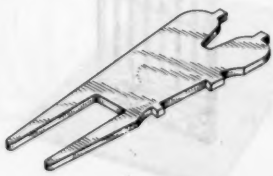
243,866
GOLF BALL
Michael Shaw, Widnes, and Robert Christopher Haines, Huddersfield, both of England, assignors to Dunlop Limited, London, England
Filed May 5, 1975, Ser. No. 574,390
Claims priority, application United Kingdom, Nov. 6, 1974, 968607/74
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 QQ



243,867
GOLF RANGE FINDER
Albert J. Williams, Jr., 901 Llanfair Road, Ambler, Pa. 19002
Filed May 14, 1976, Ser. No. 687,407
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



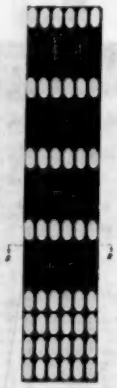
243,868
COMBINED DIVOT AND CLEAT TOOL AND DISTANCE ESTIMATING DEVICE
Albert J. Williams, Jr., 901 Llanfair Road, Ambler, Pa. 19002
Filed May 14, 1976, Ser. No. 687,405
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



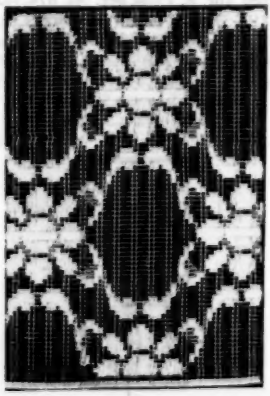
243,869
PLANTER
James F. Skalicky, 925 S. Montecito Drive, San Gabriel, Calif. 91776
Filed Aug. 18, 1975, Ser. No. 605,604
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—145

243,870
RING
Martin C. Towne, 4515 Aldon Road, Tucson, Ariz. 85714
Filed Oct. 28, 1975, Ser. No. 626,089
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D4—26

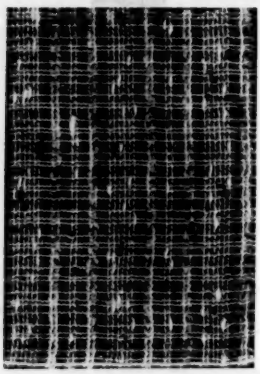
243,871
CURTAIN FABRIC
Peter E. Schroeder, Oberwil, near Breangarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Sept. 30, 1974, Ser. No. 510,716
Claims priority, application Germany, Mar. 30, 1974, 212/74
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



243,872
CURTAIN MATERIAL
Peter E. Schroeder, Am Falter 8, CH866, Lucerne, Switzerland
Filed Aug. 25, 1975, Ser. No. 607,620
Claims priority, application Germany, May 26, 1975, 360/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



243,873
CURTAIN MATERIAL
Peter E. Schroeder, Am Falter 8, CH866 Oberwil, Switzerland
Filed Sept. 29, 1975, Ser. No. 617,663
Claims priority, application Germany, May 13, 1975, 289/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



243,874
WALL-MOUNTED CANDLE STICK ASSEMBLY
Eugene P. Smith, 220 Spring St., Newport, R.I. 02840
Filed Apr. 8, 1976, Ser. No. 674,905
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

243,875
LIGHT BULB REFLECTOR
Sheldon D. Schwartz, 75 Gary Place, Staten Island, N.Y. 10314
Filed Feb. 23, 1976, Ser. No. 660,671
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

243,876
LIGHT FIXTURE
Achille Castiglioni, Piazza Castello 27, Milan, Italy
Filed May 5, 1975, Ser. No. 574,520
Claims priority, application Italy, Feb. 13, 1975, 6926/75
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

243,877
DECORATIVE NIGHT LIGHT
Curtis G. Dickson, Bar Jac Trailer Court, Perry, Iowa 50220
Filed May 9, 1975, Ser. No. 575,944
Term of patent 14 years
Int. Cl. D26—*05*; D11—*02*
U.S. Cl. D48—20 E

243,878
LAMP
Julius Kaprinyak, 7211 N. 1st St., Phoenix, Ariz. 85020
Filed Dec. 4, 1975, Ser. No. 637,578
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

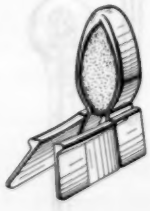
243,879
LAMP BASE
Robert Daniel O'Connell, 13262 Shasta Circle, Westminster, Calif. 92683
Filed June 7, 1976, Ser. No. 693,350
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

243,880
HEADLIGHT BEZEL
John W. Anderson, 815 Briarcliff Road, Jackson, Mich. 49203
Filed Nov. 13, 1975, Ser. No. 631,711
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 C

243,881
PNEUMATIC PAINT STIRRING APPARATUS
Robert A. Arnold, 4116 N. Cleveland, Kansas City, Mo. 64117
Filed Jan. 22, 1976, Ser. No. 651,454
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147

243,882
PLASTIC INSERT FOR EXAMINING TABLE STIRRUP
Paul W. Frame, Jr., 3300 3rd Ave., Sacramento, Calif. 95817
Filed Feb. 18, 1975, Ser. No. 550,614
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—7

243,883
FEMALE URINARY DEVICE OR THE LIKE
J. Robert Cade, 529 NW. 58th St., Gainesville, Fla. 32601, and James D. Raulerson, Rte. 2, Box 104, Alachua, Fla. 32615
Filed Feb. 19, 1976, Ser. No. 659,343
Term of patent 14 years
Int. Cl. D24—*99, 04*
U.S. Cl. D83—1 U

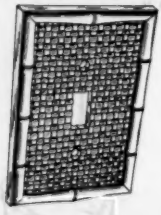


243,884
SHOULDER PROSTHESIS
John M. Fenlin, 248 S. 21st St., Philadelphia, Pa. 19103
Filed Mar. 31, 1976, Ser. No. 672,179
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E

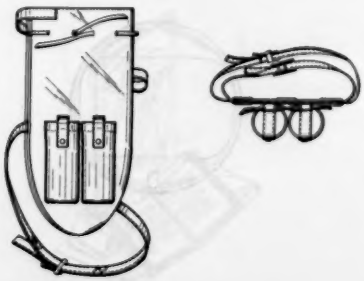
243,885
SHOULDER PROSTHESIS
John M. Fenlin, 248 S. 21st St., Philadelphia, Pa. 19103
Filed Mar. 31, 1976, Ser. No. 672,180
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

243,886
COSMETIC PENCIL OR THE LIKE
Enea Rho, Milan, Italy, assignor to Fabbrica Italiana Lapis Ed Affini (FILA) S.p.A., Italy
Filed July 8, 1974, Ser. No. 486,326
Claims priority, application Italy, June 28, 1974, 21450/74
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

243,887
WALL PLATE-BAMBOO
Monte Levin, New York, N.Y., and Joan Grieb, Westfield, N.J., assignors to General Electric Company
Filed Sept. 16, 1975, Ser. No. 613,833
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351



243,888
CARRYING CASE FOR A TENNIS RACKET AND ACCESSORIES
Alvin T. Smith, 4915 Indian Wood Road, No. 601, Culver City, Calif. 90250
Filed July 22, 1974, Ser. No. 490,372
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

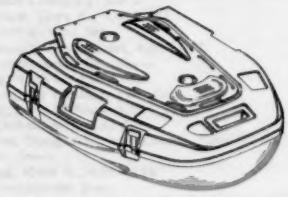


243,889

SCUBA DIVER BACK PACK

William D. Walters, Costa Mesa, Calif., assignor to William D. Waters, Costa Mesa, Calif.

Filed Sept. 22, 1975, Ser. No. 615,237
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D87—1 R



243,890

CAP OF AN ELECTRIC SHAVER

Yozo Yajima, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Japan

Filed June 19, 1975, Ser. No. 588,191
Claims priority, application Japan, Dec. 19, 1974, 49-44564
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

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PATENTS WERE ISSUED ON THE 29TH DAY OF MARCH, 1977

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Aisin Seiki Co., Ltd.: *See—*
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Aiti, Guglielmo. Device for improved efficiency in internal combustion. 4,014,303, Cl. 123-124.00R.

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Alfonso, Armando. Fortune-telling game. 4,014,551, Cl. 273-161.000.

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Kirillov, Ivan Ivanovich; Agishev, Alexandr Petrovich; Ameljushkin, Vladimir Nikolaevich; Bogdanovich, Sabir Yakubovich; Guseinov, Chingiz Saibovich; Medvedev, Valentin Valentinovich; Faddeev, Igor Petrovich; and Rozin, Viktor Sergeevich, 4,014,674.

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Bandoch, Rudolf; Marecek, Miroslav; and Rotkerl, Otto, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Fabric spreader for circular knitting machine. 4,014,187, Cl. 66-147.000.

Barakaev, Khristofor Fedorovich; Gilim, Alexandr Sergeevich; Stukachev, Anatoly Viktorovich; and Shulga, Robert Nikolaevich. Method for overvoltage protection of HVDC transmission line systems. 4,015,170, Cl. 361-91.000.

Barber, Franklin T., to Phillips Petroleum Company. Antifreeze recovery system. 4,014,667, Cl. 55-32.000.

Barer, Sol Joseph; Stockel, Richard Frederick; and Valenti, Peter Carl, to National Patent Development Corporation. N,N-dichloro substituted aminocarboxylic acids as microbiocides. 4,015,008, Cl. 424-274.000.

Baril, Michel: *See*—
Gagnon, Marcel; Baril, Michel; D'Aillon, Francois-Gros; and Savoie, Claude, 4,015,121.

Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, to Centro Sperimentale, Metallurgico S.p.A.; and Terni Societa per l'Industria e l'Elettricita S.p.A. Method for the production of high-permeability magnetic steel. 4,014,717, Cl. 148-111.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,014,476.

Barnes, Vernon M., Jr.; Flournoy, Norman E.; and Horton, Eugene B., Jr., to Texaco Inc. Shock proof event recorder. 4,015,270, Cl. 346-139.00R.

Baron, Gerhard: *See*—
Werner, Karl-Heinz; Baron, Gerhard; and Fadler, Kurt, 4,014,423.

Bartel, William J.: *See*—
French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, 4,014,575.

Barteri, Massimo: *See*—
Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, 4,014,717.

Barton, Troyce D., to Texas Instruments Incorporated. DC-DC converter in watch system. 4,014,165, Cl. 58-23.0BA.

Bartuska, William R.: *See*—
Silverman, Paul; and Bartuska, William R., 4,014,468.

Baruch, Stenton A.: *See*—
Ruggles, Charles F.; and Baruch, Stenton A., 4,014,570.

Barza, Michael J.: *See*—
United States of America, National Aeronautics and Space Administration; Chappelle, Emmett W.; Picciolo, Grace L.; Vellend, Hillar; Tuttle, Stephanie A.; Barza, Michael J.; and Weinstein, Louis, 4,014,745.

Basalay, Robert J.; Pappas, Peter G.; and Edmisten, Walter C., to Standard Oil Company (Indiana). Crude oils and residual fuel oils containing a terpolymer of ethylene, vinyl ester, and dialkylvinyl carbinol. 4,015,063, Cl. 526-331.000.

BASF Aktiengesellschaft: *See*—
Boettger, Guenther; Corr, Hubert; Hoffmann, Herwig; Toussaint, Herbert; and Winderl, Siegfried, 4,014,933.
Fischer, Adolf, deceased; Rohr, Wolfgang; and Reitel, Christian, 4,014,904.
Hamprecht, Gerhard, 4,014,931.
Henning, Georg, 4,014,866.
Horn, Peter; and von Rumohr, Cai, 4,014,849.

BASF Farben & Fasern Aktiengesellschaft: *See*—
Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,014,084.

BASF Wyandotte Corporation: *See*—
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T., Jr.; and Murphy, John R., 4,014,846.

Basov, Valentin Georgievich: *See*—
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Bassett, James G., Jr.; and Gilbert, Saul, to United States Steel Corporation. Deoxidation of open type steels for improved formability. 4,014,686, Cl. 75-58.000.

Bates, Charles Ross. Carpet cleaning implement. 4,014,067, Cl. 15-320.000.

Bau, Marcel. Device for retrieving animal waste. 4,014,584, Cl. 294-19.00R.

Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, to BASF Farben & Fasern Aktiengesellschaft. Texturizing of filaments. 4,014,084, Cl. 28-72.110.

Bausch & Lomb Incorporated: *See*—
Morton, Roger Roy Adams, 4,015,108.

Bavina, Tamara Vasilievna: *See*—
Dremin, Anatoly Nikolaevich; Breusov, Oleg Nikolaevich; Bavina, Tamara Vasilievna; and Pershin, Sergei Vladimirovich, 4,014,979.

Baxter Travenol Laboratories, Inc.: *See*—
Kiesow, Lutz A., 4,014,649.

Bayer Aktiengesellschaft: *See*—
Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., 4,014,735.
Haas, Friedrich; Nutzel, Karl; and Jahn, Hans-Joachim, 4,014,848.
Kaiser, Bernd-Ulrich; Dhein, Rolf; Kuchenmeister, Rolf; and Fischler, Hans-Michael, 4,014,708.
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,014,923.
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,014,996.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,014,998.
Miessen, Ralf; Blankenstein, Gunter; Korte, Siegfried; and Suling, Carlhans, 4,014,958.
Neeff, Rutger, 4,014,647.
Rosenkranz, Hans Jurgen; Rudolph, Hans; and Haus, Artur, 4,014,771.
Stephan, Gunter; and Schundehutte, Karl Heinz, 4,014,863.
Stetter, Hermann; and Schreckenberg, Manfred, 4,014,889.
Woditsch, Peter; Hund, Franz; Buxbaum, Gunter; Hahnkamm, Volker; and Pflugmacher, Ingo, 4,014,710.
Wollweber, Hartmund; Niemers, Ekkehard; Schulz, Hans Peter; Thomas, Herbert; and Andrews, Peter, 4,015,012.

Bearce, Wendell E. Dryer. 4,014,106, Cl. 34-142.000.

Beaty, Thomas, Jr.; and Samander, Asib S., to B & K Hydraulic Co. Automatic palletizer method and apparatus. 4,014,430, Cl. 198-588.000.

Beauducel, Claude: *See*—
Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, 4,015,242.

Becker, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Conversion device of a storage drum for sheet transfer. 4,014,261, Cl. 101-230.000.

Beckert, Alexander; and Knobbe, Karl-Heinz, to Mohndruck, Reinhard Mohn oHG, Firma. Device for drying and setting the adhesive on backs of books. 4,014,732, Cl. 156-380.000.

Bedford, Beryl A. Safety stop for overhead track switch. 4,014,269, Cl. 104-250.000.

Beecham Group Limited: *See*—
Berry, Antony Rodney; and Camburn, Ian David, 4,014,868.
Cantello, Barry Christian Charles; Buckle, Derek Richard; and Smith, Harry, 4,014,907.

Behrenz, Wolfgang: *See*—
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,014,923.
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,014,996.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,014,998.

Beier, Helmut: *See*—
Bitsch, Rainer; Marin, Heiner; and Beier, Helmut, 4,015,095.

Bell, George Richard; and Lamar, Richard Seyb, to Johns-Manville Corporation. Removing of bark fines from aqueous suspensions. 4,014,788, Cl. 210-42.00R.

Bell Telephone Laboratories, Incorporated: *See*—
Bellisio, Jules Angelo, 4,015,083.
Dubnowski, John Joseph; Rabiner, Lawrence Richard; and Schafer, Ronald William, 4,015,088.
Dybwad, Gay Leon, 4,014,729.
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,014,853.
Rao, Tadikonda Narasimha; and Toumani, Rouben, 4,015,091.
Wallace, Robert Lee, Jr., 4,015,148.
Werner, Jean-Jacques, 4,015,222.
Zipfel, George Gustave, Jr., 4,015,159.

Belli, Frank G.: *See*—
Buckley, David A.; and Belli, Frank G., 4,014,695.

Bellisio, Jules Angelo, to Bell Telephone Laboratories, Incorporated. Timing recovery circuit for digital data. 4,015,083, Cl. 178-69.100.

Beloit Corporation: *See*—
Adams, Richard J., 4,014,227.

Ben Tunis Company, Inc.: *See*—
Tunis, Philip, 4,014,436.

Bendik, John. Fish hook extractor. 4,014,131, Cl. 43-53.500.

Bendler, Hellmut; and Gawlick, Heinz, to Dynamit Nobel Aktiengesellschaft. Combined igniter cap. 4,014,264, Cl. 102-46.000.

Bennett, Richard Nelson, to National Instrument Company, Inc. Discharge nozzle structure. 4,014,472, Cl. 239-533.100.

Benzinger, Hans, to Thielscher-Electronic Gerhard Thielscher. Active band-pass filter. 4,015,224, Cl. 333-70.00R.

Berges, Timothy J., to Sanchez Enterprises, Inc. Three-function container. 4,014,458, Cl. 220-335.000.

Berkel GmbH: *See*—
Lohmann, Ernst; and Sacht, Hans-Joachim, 4,014,396.

Berman, Alan M. Divider net with replaceable bottom panel. 4,014,521, Cl. 256-1.000.

Bernard, Richard A.: *See*—
McDonough, William F.; Montlick, James A.; and Bernard, Richard A., 4,015,131.

Berni, Rene P.; Lorenz, Donald H.; and Williams, Earl Pierce, to GAF Corporation. Recovery of lactam solvent from vinyl polymer solution. 4,014,754, Cl. 203-64.000.

Berry, Antony Rodney; and Camburn, Ian David, to Beecham Group Limited. Preparation of β-lactam antibiotics. 4,014,868, Cl. 260-239.100.

Bertolacini, Ralph J.: *See—*
Zimmerschied, Wilford J.; Palmer, David A.; and Bertolacini, Ralph J., 4,014,945.

Bete Fog Nozzle, Inc.: *See—*
Burnham, Richard C., 4,014,470.

Bettenhausen, Larry A., to Minnesota Mining and Manufacturing Company. Apparatus for die cutting indicia on a multilayer tape. 4,014,257, Cl. 101-26.000.

Bettinger, Ella M.; and Mincey, Everett K., to Mallinckrodt, Inc. Method for determining thyroid function and reagent composition therefor. 4,014,651, Cl. 23-230.600.

Betts, Robert E., to United States of America, Army. Blast simulator. 4,014,262, Cl. 102-28.00R.

Beviss, Harold Fred: *See—*
Walker, Bertram; and Beviss, Harold Fred, 4,014,371.

Bhasin, Madan Mohan: *See—*
Ellgen, Paul Clifford; and Bhasin, Madan Mohan, 4,014,913.

Bialek, Stephen M., to Providence Pile Fabric Corporation. Variable yarn feed device. 4,014,489, Cl. 226-9.000.

Bianchi, Massimo: *See—*
Conti, Paolo; and Bianchi, Massimo, 4,014,188.

Bickel, Hans: *See—*
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,015,000.
Peter, Heinrich; Muller, Beat; Sibral, Walter; and Bickel, Hans, 4,014,874.

Binns, John W. Latching apparatus for a truck door. 4,014,572, Cl. 292-108.000.

Birchall, James Derek; and Cassidy, John Edward, to Imperial Chemical Industries Limited. Plastics film with an aluminium phosphate coating. 4,015,050, Cl. 428-480.000.

Bishop, Alan Martin: *See—*
Stalley, Anthony Donald; and Bishop, Alan Martin, 4,014,598.

Bitsch, Rainer; Marin, Heiner; and Beier, Helmut, to Siemens Aktiengesellschaft. Contact arrangement for an electric compressed-gas circuit breaker. 4,015,095, Cl. 200-148.00A.

Bitti, Roberto Ricci: *See—*
Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, 4,014,717.

Bjorksten Research Laboratories, Inc.: *See—*
Dunn, Stanley Austin, 4,015,105.

Black, William C., to Penick & Ford, Limited. Method for continuous preparation of cooked thinned starch pastes. 4,014,743, Cl. 195-31.00R.

Blackman, Seymour N. Clinical glass thermometer having a stem and a bulb integrally formed therewith. 4,014,215, Cl. 73-371.000.

Blad, Leiv H.; and Warkow, Robert F., to Lockheed Aircraft Corporation. Method of forming fiber-reinforced epoxy composite joints, and product thereof. 4,015,035, Cl. 428-60.000.

Blaha, Eli W.: *See—*
Chipman, Gary R.; Henk, Michael G.; De Boer, Jacob A.; and Blaha, Eli W., 4,014,858.

Blanding, Douglass L., to Eastman Kodak Company. Cutaway tape guide for selectively cooperating with a capstan and guiding a tape. 4,015,293, Cl. 360-130.000.

Blankenstein, Gunter: *See—*
Miessen, Ralf; Blankenstein, Gunter; Korte, Siegfried; and Suling, Carlhans, 4,014,958.

Bletz, Walter, to Ernst Leitz G.m.b.H. Digital timer for a photographic camera shutter. 4,015,275, Cl. 354-23.00D.

Bliss & Laughlin Ind., Inc.: *See—*
Peet, Robert L., 4,015,071.

Bluestein, Ben A., to General Electric Company. Polyolefin-filled vinyloranopolysiloxane composition and method of preparation. 4,014,851, Cl. 260-42.260.

Bobtex Corporation Limited, The: *See—*
Slanik, Josef Milan, 4,014,076.

Bock, Jan; Thame, Neville G.; and Westerman, Lowell, to Exxon Research and Engineering Company. Novel ionic polymer compositions. 4,014,831, Cl. 260-23.00H.

Boehringer Ingelheim GmbH: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst Otto; Pichler, Ludwig; and Traunecker, Werner, 4,015,011.

Boeing Company, The: *See—*
Nelson, Neal A.; and Jacobus, Clarence E., 4,014,486.

Boettger, Guenther; Corr, Hubert; Hoffmann, Herwig; Toussaint, Herbert; and Winderl, Siegfried, to BASF Aktiengesellschaft. Production of amines from alcohols. 4,014,933, Cl. 260-563.00R.

Bogdanov, Nikolai Ivanovich; Vitchenko, Vladimir Stepanovich; Smirnov, Gennady Konstantinovich; and Shalaev, Vladimir Grigorievich. Device for electrical coupling of generator and exciter rotor current leads. 4,014,599, Cl. 339-5.00R.

Bogdanovich, Sabir Yakubovich: *See—*
Kirillov, Ivan Ivanovich; Agishev, Alexandr Petrovich; Ameljushkin, Vladimir Nikolaevich; Bogdanovich, Sabir Yakubovich; Guseinov, Chingiz Saibovich; Medvedev, Valentin Valentinovich; Faddeev, Igor Petrovich; and Rozin, Viktor Sergeevich, 4,014,674.

Bogomolova, Larisa Evgenievna: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Bohm, Gosta Martin: *See—*
Naslund, Soren; and Bohm, Gosta Martin, 4,014,266.

Boliden Aktiebolag: *See—*
Anttila, Lars Alrik; Fahlstrom, Per Anders Herman Henningsson; Fagremo, Ernst Olov; Hedman, Verner Herbert; and Aberg, Sven Goran, 4,014,474.

Bonacina, Jean-Claude. Security winch for divers. 4,014,478, Cl. 242-107.000.

Boos, Donald L.: *See—*
Selover, Theodore B., Jr.; Boos, Donald L.; and Hacha, Thomas H., 4,014,730.

Border Steel Mills, Inc.: *See—*
Lupia, Arthur W.; Gonzalez, Jesus; and Thurman, Garrett, 4,014,197.

Borowick, John, to United States of America, Army. Radar dipole antenna array. 4,015,266, Cl. 343-815.000.

Bosch, Paul, to Robert Bosch G.m.b.H. Cylinder block positioning arrangement for a hydraulic axial piston machine. 4,014,250, Cl. 91-487.000.

Boston University, Trustees of: *See—*
Pameijer, Cornelis H., 4,014,097.

Bostrom, Robert G.: *See—*
Landry, Robert Joseph; Bostrom, Robert G.; and Peterson, Richard W., 4,015,130.

Boudeville, Jean-Claude, to Regie Nationale des Usines Renault. Device for controlling safety seat belts. 4,015,236, Cl. 340-52.00E.

Bovier, Edward M.: *See—*
Musselman, Camillus B.; and Bovier, Edward M., 4,014,727.

Bowen, Burlie R.: *See—*
Kelly, James A.; Ames, Thomas J.; Lochte, Glen E.; and Bowen, Burlie R., 4,014,180.

Bowers, Harry Alvin: *See—*
Gilmer, James Ray; Bowers, Harry Alvin; and Day, Robert Earl, 4,014,323.

Bowers, Jack R., to Sangamo Electric Company. Low power recording instrument with two or more tracks. 4,015,290, Cl. 360-63.000.

Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 4,014,901, Cl. 260-340.900.

Bowman, Robert Mathews; and Gschwend, Heinz Werner, to Ciba-Geigy Corporation. 5,6-Benzoisoindolines. 4,014,899, Cl. 260-326.100.

Bowman, William T. Computation word builder. 4,014,113, Cl. 35-74.000.

Bozzuto, Carl R.: *See—*
Klein, Herschel A.; and Bozzuto, Carl R., 4,014,978.

Bragg, Edward J., to Metex Corporation. Column packing. 4,014,557, Cl. 277-230.000.

Brandt, James B. Variable speed and direction transmission prime mover system. 4,014,222, Cl. 74-687.000.

Brandt Manufacturing Co.: *See—*
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Brandt-Pra, Inc.: *See—*
Jones, Alan P., 4,015,110.

Brandt, Siegfried: *See—*
Gude, Fritz; Brandt, Siegfried; Wolf, Elmar; and Obendorf, Johann, 4,014,954.

Brandt, Vernon, to Brandt Manufacturing Co. Apparatus for transmission-throttle control. 4,014,218, Cl. 74-474.000.

Braun Aktiengesellschaft: *See—*
Klauer, Hans-Dieter, 4,015,151.
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Breisch, John H. Knock-down sawhorse. 4,014,405, Cl. 182-181.000.

Brennan, Robert M. Method of molding preform having 600% by weight water. 4,014,737, Cl. 162-226.000.

Breusov, Oleg Nikolaevich: *See—*
Dremin, Anatoly Nikolaevich; Breusov, Oleg Nikolaevich; Bavina, Tamara Vasilievna; and Pershin, Sergei Vladimirovich, 4,014,979.

Brezinski, Julius John: *See—*
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Bridgestone Tire Company Limited: *See—*
Kondo, Osamu; Hashimoto, Torao; and Hasegawa, Hajime, 4,014,809.

Bridigum, Robert J., to Westinghouse Air Brake Company. Emergency brake valve device for railway vehicles. 4,014,580, Cl. 303-82.000.

Briggs & Stratton Corporation: *See—*
Grogan, Robert D., 4,014,195.
Houston, George F., 4,014,302.

Brink, Douglas F. Cable and pipe laying machine. 4,014,175, Cl. 61-72.600.

Brinkman, Earl W., to Davenport Machine Tool Co., Inc. Chuck-closing mechanism for automatic screw machine. 4,014,558, Cl. 279-50.000.

British Aircraft Corporation Limited: *See—*
Meston, Spencer Davidson, 4,014,617.

British Gas Corporation: *See—*
Jones, Derek Arthur; and Cox, Robert William, 4,014,316.

British Petroleum Company Limited, The: *See—*
Park, Anthony John; and Sturt, Alan Charles, 4,015,065.

Broadwell, Edward; and Thompson, William Charles, to Alfa-Laval AB. Method and apparatus for centrifuging sludge-containing liquids. 4,014,498, Cl. 233-20.00R.

Brouckaert, Freddy Achiel Cornelius, to U.S. Philips Corporation. Circuit arrangement for conversion of an analog signal into a binary signal. 4,015,144, Cl. 307-261.000.

Brown, Glenn L.: *See—*
Ingersoll, Elmer Wayne, 4,014,306.
Brown, Howard P. Greenhouse structure. 4,014,133, Cl. 47-17.000.
Brown & Root, Inc.: *See—*
Weidler, Jay B., Jr., 4,014,176.
Brown, Webster W., Jr., to Phillips Petroleum Company. Method for purifying HF catalyst in an isoparaffin-olefin alkylation. 4,014,953, Cl. 260-683.480.
Brown, Yull. Welding. 4,014,777, Cl. 204-270.000.
Browning & Bushman: *See—*
Todd, Robert E., 4,014,574.
Brownlee, Robert R.; Tyers, G. Frank O.; and Volz, Carl, Sr., to Research Corporation. Hermetically sealed cardiac pacer system and recharging system therefor. 4,014,346, Cl. 128-419.0PS.
Brozzo, Pietro: *See—*
Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, 4,014,717.
Bruce, Larry L.: *See—*
Cluff, Kenneth C.; and Bruce, Larry L., 4,014,328.
Brunnberg, Bernt, to Nitro Nobel A.B. Plant for continuous production of explosive containing explosive oil. 4,014,655, Cl. 23-266.000.
Bruno, Anthony M., to United States of America, Health, Education and Welfare. Multipurpose cardiocirculatory assist cannula and methods of use thereof. 4,014,317, Cl. 128-1.00D.
Brunswick Corporation: *See—*
Kollman, Delhardt K., 4,014,282.
Bryan, Clifford Chandler, to Samcoe Holding Corporation. Method for processing of sweater sections and the like. 4,014,081, Cl. 26-18.500.
Bryan, John F., Jr. Spike orienting and positioning system. 4,014,460, Cl. 221-156.000.
Bryant, Clyde C. Disc brake with fluid cooled actuator. 4,014,410, Cl. 188-71.600.
Bryndal, Richard J., to Union Carbide Corporation. Cathode-depolarizer mix containing a polyacrylamide binder. 4,014,712, Cl. 429-57.000.
Buchan, William R.; and Moore, Robert A., to Itek Corporation. Electrophotographic toner transfer and fusing method. 4,015,027, Cl. 427-22.000.
Bucher, Albert: *See—*
Spiewok, Leonhard; and Bucher, Albert, 4,014,497.
Buckenmayer, Robert H., to Airwick Industries, Inc. Container for air treating material. 4,014,501, Cl. 239-58.000.
Buckle, Derek Richard: *See—*
Cantello, Barry Christian Charles; Buckle, Derek Richard; and Smith, Harry, 4,014,907.
Buckley, David A.; and Belli, Frank G., to Xerox Corporation. Migration imaging method employing migration member having a surface skin. 4,014,695, Cl. 96-1.0PS.
Budd Company, The: *See—*
Eggert, Walter S., Jr., 4,014,587.
Jahnle, Herbert A., 4,014,970.
Budde, Paul B.: *See—*
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Vatne, Robert D.; Budde, Paul B.; and Arrington, Jack P., 4,015,014.
Budzinski, Edward Stanislaw: *See—*
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Bui, Ai: *See—*
Lagasse, Jean; Clot, Jean; Falipou, Jean; Loubieres, Andre; Rabischong, Pierre; Richard, Jean-Pierre; and Bui, Ai, 4,014,217.
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Lejdegard, Sixten H.; and Henriksson, Nils E., 4,014,225.
Bunke, Edward J., to Raymond Lee Organization, Inc., The, a part interest. Apparatus for cleaning tubes and fittings. 4,014,063, Cl. 15-111.000.
Bures, Miroslav: *See—*
Krejcir, Oldrich; Bures, Miroslav; and Jerabek, Alois, 4,014,533.
Burger, Manfred Rolf. Air conditioning methods and apparatus. 4,014,181, Cl. 62-114.000.
Burk, George A.: *See—*
Goralski, Christian T.; and Burk, George A., 4,014,891.
Burke, George K.: *See—*
Raines, Kenneth; and Burke, George K., 4,014,797.
Burkin, Jury Alexandrovich; and Metlyaev, Jury Valentinovich. Method for making memory plane for magnetic decoder. 4,014,092, Cl. 29-604.000.
Burkwall, Morris P., Jr.; Engstrom, Carl D.; and Snyder, Robert F., to Quaker Oats Company, The. Process for preparing a moist pet food additive, the additive, and the resultant pet food. 4,015,026, Cl. 426-582.000.
Burnham, Richard C., to Bete Fog Nozzle, Inc. Conical spray nozzle. 4,014,470, Cl. 239-472.000.
Burron Medical Products, Inc.: *See—*
Raines, Kenneth; and Burke, George K., 4,014,797.
Burton, Robert S., III: *See—*
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Buschbeck, Jurgen; and Pfeiffer, Wilfried, to U.S. Philips Corporation. X-ray film holder. 4,015,132, Cl. 250-481.000.
Bussmann, Heinz: *See—*
Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Bussmann, Heinz; Voss, Karl; Schaffer, Helmut; and Junkersdorf, Willi, 4,014,491.
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Bycroft, George William: *See—*
Thorp, Peter; and Bycroft, George William, 4,014,569.
C.A.V. Limited: *See—*
Skinner, Robert Thomas John; and Sosnowski, Stanislaw Jan Antoni, 4,014,305.
C.G. Conn, Ltd.: *See—*
Southard, James S., 4,014,238.
Cabo, Amado; and Pops, Horace, to Essex International, Inc. Wrought brass alloy having a low spring back coefficient and shape memory effect. 4,014,716, Cl. 148-11.50C.
Caffrey, James M., Jr.: *See—*
Paull, Peter L.; and Caffrey, James M., Jr., 4,014,982.
Calcagno, Benedetto: *See—*
Ferlazzo, Natale; Buzzi, Gian Fausto; Ghirga, Marcello; and Calcagno, Benedetto, 4,014,925.
Caldwell, Joseph H.: *See—*
Cannon, Sidney E.; Keith, Billy M.; Cannon, Charles E.; and Caldwell, Joseph H., 4,014,451.
Calgon Corporation: *See—*
Johnson, Bruce C.; Sinha, Rabindra Kumar; and Urbanic, John Emery, 4,014,817.
California Institute of Technology: *See—*
Rembaum, Alan, 4,014,798.
Calspan Corporation: *See—*
Swonger, Claron W.; Ryan, Hollis F.; Stock, Robert M.; and Vossler, Charles M., 4,015,240.
Calumet Co., Inc., The: *See—*
Rohlf, Vincent E.; Kratz, Karl R.; and Hucek, Richard F., 4,014,271.
Cama, Lovji D.: *See—*
Christensen, Burton G.; Cama, Lovji D.; Sletzinger, Meyer; and Karady, Sandor, 4,014,873.
Camarda, Joseph, to Les Bernard, Inc. Bracelet type fastening device. 4,014,079, Cl. 24-201.0HE.
Camburn, Ian David: *See—*
Berry, Antony Rodney; and Camburn, Ian David, 4,014,868.
Cameco AB: *See—*
Muller, Robert, 4,014,326.
Campbell, Robert R., to United States of America, Navy. Time sharing circuit for guard radar receiver in radar ranging system. 4,015,261, Cl. 343-18.00E.
Campbell, Ronald B., Jr., to Raytheon Company. Digital MTI radar. 4,015,260, Cl. 343-7.700.
Campbell Taggart, Inc.: *See—*
Cannon, Sidney E.; Keith, Billy M.; Cannon, Charles E.; and Caldwell, Joseph H., 4,014,451.
Canadian International Paper Company: *See—*
Sexton, Ernest Arthur, 4,014,736.
Canadian Patents and Development Limited: *See—*
Donnay, Gabrielle; and Le Page, Yvon, 4,015,125.
Jarlan, Gerard Eugene, 4,014,177.
Cannon, Charles E.: *See—*
Cannon, Sidney E.; Keith, Billy M.; Cannon, Charles E.; and Caldwell, Joseph H., 4,014,451.
Cannon, Sidney E.; Keith, Billy M.; Cannon, Charles E.; and Caldwell, Joseph H., to Campbell Taggart, Inc. Bread pan for baking miniature loaves. 4,014,451, Cl. 220-20.500.
Canon Kabushiki Kaisha: *See—*
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; Uchidoi, Masanori; Ito, Tadashi; and Iura, Yukio, 4,015,198.
Karube, Yukuo; Suzuki, Koji; and Ezaki, Ryoichi, 4,015,181.
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Yazaki, Mutsunobu; Sanada, Noriaki; and Taguchi, Tetsuya, 4,015,277.
Canon Seiki Kabushiki Kaisha: *See—*
Karube, Yukuo; Suzuki, Koji; and Ezaki, Ryoichi, 4,015,181.
Cantello, Barry Christian Charles; Buckle, Derek Richard; and Smith, Harry, to Beecham Group Limited. 2-Hydroxy-3-nitro-1,4-naphthoquinones. 4,014,907, Cl. 260-396.00R.
Cantrell, Bob I.: *See—*
Cantrell, Sally H.; and Cantrell, Bob I., 4,014,566.
Cantrell, Sally H.; and Cantrell, Bob I. Pocket-sized checkbook. 4,014,566, Cl. 282-8.00R.
Capra, Gerald N., to Capra, Theodore. Fishing rod stabilizing handle. 4,014,129, Cl. 43-23.000.
Capra, Theodore: *See—*
Capra, Gerald N., 4,014,129.
Caradec, Alain. Device for automatically separating two sections of a strap. 4,014,080, Cl. 24-230.00R.
Cardenes Armas, Gregorio. Residual fuel deriving from petroleum crude by thermal shock cracking. 4,014,782, Cl. 208-130.000.
Carieri, Carl R. Cleaning system for dishware and related items. 4,014,356, Cl. 134-63.000.
Carle, Udo: *See—*
Vural, Gulertan; and Carle, Udo, 4,014,620.
Carpenter, Donald G. Electrical technique. 4,014,168, Cl. 60-202.000.
Carragan, John F.: *See—*
Lundin, Robert S.; and Carragan, John F., 4,015,193.
Carrier Corporation: *See—*
Clark, William E., 4,014,381.

Eckman, Raymond L.; and Wood, Russell E., 4,015,104.
Carter, Clinton L. Locking mechanism. 4,014,193, Cl. 70-288.000.
Carter, George William: *See—*
Swett, Leo Ralph; Stein, Robert George; and Carter, George William, 4,014,997.
Carter, Graham; and Hinton, Anthony John, to Imperial Chemical Industries Limited. Water treatment for controlling the growth of algae employing biguanides. 4,014,676, Cl. 71-67.000.
Carter, J. Warne; and Neher, Martin Duane, to Ciba-Geigy Corporation. Pipe joint. 4,014,568, Cl. 285-39.000.
Carter, Peter Laurence, to Fisons Limited. Aminomethylenemalonitriles. 4,014,917, Cl. 260-465.00E.
Casey, James P.: *See—*
Walsh, David I.; Casey, James P.; Corneau, George E.; and Laird, William F., 4,014,648.
Cassidy, John Edward: *See—*
Birchall, James Derek; and Cassidy, John Edward, 4,015,050.
Castaldo, Stanley C. Method of making illuminated handbag. 4,015,112, Cl. 240-6.45P.
Castrantas, Harry Marcus, to FMC Corporation. Dry cleaning formulation. 4,014,805, Cl. 252-104.000.
Cateora, Joseph V.; Davis, Dicky D.; and Hanson, D. Wayne, to United States of America, Commerce. Satellite controlled digital clock system. 4,014,166, Cl. 58-26.00R.
Caterpillar Mitsubishi Ltd.: *See—*
Kohriyama, Yoshimasa, 4,014,588.
Caterpillar Tractor Co.: *See—*
Cline, Lawrence R.; and Hogg, Theodore B., 4,014,400.
Goloff, Alexander, 4,014,631.
Groff, Eugene R., 4,014,581.
Ruseff, Walter Zdzislaw; and Tribley, Gilbert, 4,014,628.
Stedman, Robert N.; and Moser, Raymond L., 4,014,446.
Caulkins, Ted L., to Game Time, Inc. Swing mount for playground equipment. 4,014,540, Cl. 272-85.000.
Cazenave, Paul: *See—*
Horman, Ian; and Cazenave, Paul, 4,015,024.
Cecil, Tom A.: *See—*
Dykstra, Franz R.; Allegrini, Aldo P.; Mallary, Miller B.; and Cecil, Tom A., 4,014,709.
CEDA, S.p.A.: *See—*
Della Vedova, Ferruccio, 4,015,128.
Celanese Coatings & Specialties Company: *See—*
Rumfield, Robert D., 4,014,830.
Cellers, Warren G. Rotary massaging device and method of using same. 4,014,324, Cl. 128-46.000.
Center for Communications Research, Inc.: *See—*
Stewart, Leslie C., 4,015,087.
Central Sprinkler Corporation: *See—*
Anderson, James R., 4,014,388.
Centre Electronique Horloger S.A.: *See—*
Hammer, Walter; and Martin, Jean-Claude, 4,015,208.
Centro Sperimentale, Metallurgico S.p.A.: *See—*
Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, 4,014,717.
Cerulli, Ludovico: *See—*
Welch, Joseph D.; Doyle, Barbara J.; Weintraub, Harvey A.; and Cerulli, Ludovico, 4,014,329.
Cerwin, Robert J., to Ethican, Inc. Package for moisture sensitive sutures and method for making same. 4,014,433, Cl. 206-63.300.
Ceskoslovenska akademie ved: *See—*
Tesarik, Karel; and Krejci, Milos, 4,014,793.
Cessna, Lawrence C., Jr., to Hercules Incorporated. Pressless injection molding. 4,014,974, Cl. 264-328.000.
Cha, Chang Yul: *See—*
French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, 4,014,575.
Chaffee, Bertram J., to Mono-Probe Corporation. Electrical continuity and voltage testing device. 4,015,201, Cl. 324-51.000.
Chakrin, Lawrence William; Snader, Kenneth Means; and Willis, Chester Rhodes, to SmithKline Corporation. Pharmaceutical compositions comprising substituted 3-cinnamoyl-2H-pyran-2,6(3H)-diones. 4,015,009, Cl. 424-283.000.
Chancler, Francis X.; and Moser, Vincent J., to Rohm and Haas Company. Dyeable polyolefin backing for tufted surface coverings. 4,014,645, Cl. 8-17.000.
Chang, Eppie Sheng, to Miles Laboratories Inc. Processes for measuring tri-, di- and monoglycerides. 4,014,744, Cl. 195-103.50R.
Chappelle, Emmett W.: *See—*
United States of America, National Aeronautics and Space Administration; Chappelle, Emmett W.; Picciolo, Grace L.; Vellend, Hillar; Tuttle, Stephanie A.; Barza, Michael J.; and Weinstein, Louis, 4,014,745.
Charles O. Larson Co.: *See—*
Larson, Charles O., 4,014,244.
Charles Stark Draper Laboratory, Inc., The: *See—*
Hopkins, Albert L., Jr.; and Smith, Thomas Basil, III, 4,015,246.
Chassaigne, Yves Gilbert, to Eastman Kodak Company. Materials for magnetic recording having high resistance to wear and reduced abrasion on magnetic heads. 4,015,042, Cl. 428-325.000.
Cheever, Douglas L.; and Knodle, Faye L., to A. Y. McDonald Mfg. Co. Tamperproof plug valve. 4,014,512, Cl. 251-309.000.
Cheng, Chia-Chung: *See—*
Zee-Cheng, Kwang Yuen; and Cheng, Chia-Chung, 4,014,885.
Cherdron, Harald: *See—*
Kirsch, Gunther; Cherdron, Harald; and Herwig, Walter, 4,014,957.
Cherian, Abraham, to Xerox Corporation. Removable screening system for a transparency reproduction machine. 4,014,607, Cl. 355-3.00R.
Cherian, Abraham, to Xerox Corporation. Fuser conveyor belt. 4,015,103, Cl. 219-216.000.
Cheron, Jacques, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Fuel cell. 4,015,052, Cl. 429-14.000.
Cheslow, Ernest, to Johnson & Johnson. Tape closure having a slot for receiving a diaper corner therethrough. 4,014,340, Cl. 128-287.000.
Chevron Research Company: *See—*
Fredriksson, Oke A.; and Thomas, Elmer L., 4,015,202.
Cheze, Rene, to Thomson-CSF. HF Antenna matching device. 4,015,223, Cl. 333-17.00M.
Chipman, Gary R.; Henk, Michael G.; De Boer, Jacob A.; and Blaha, Eli W., to Standard Oil Company. Polybutylene terephthalate. 4,014,858, Cl. 260-75.00R.
Chisholm, Douglas S.: *See—*
Stube, Steven H.; and Chisholm, Douglas S., 4,014,965.
Christensen, Burton G.; Cama, Lovji D.; Sletzinger, Meyer; and Karady, Sandor, to Merck & Co., Inc. Process for the production of 7-acylamidocephalosporins. 4,014,873, Cl. 260-243.00C.
Christensson, Od Wikar, to Asseltepac Aktiebolag. Cup formed container having edge flange. 4,014,496, Cl. 229-31.00R.
Christopherson, Rodger L.; and Sorokin, George J., to PSC Technology, Inc. Optical motion picture film printer. 4,014,112, Cl. 355-50.000.
Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,014,768, Cl. 204-158.00R.
Chvertko, Anatoly Ivanovich: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.
Chylewski, Christoph: *See—*
Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 4,014,699.
Ciba-Geigy AG: *See—*
Marthaler, Max, 4,014,698.
Renner, Alfred, 4,014,955.
Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 4,014,699.
Ciba-Geigy Corporation: *See—*
Balke, David E.; Perez, Donald E.; and Sury, Yel S., 4,014,879.
Bowman, Robert Mathews; and Gschwend, Heinz Werner, 4,014,899.
Carter, J. Warne; and Neher, Martin Duane, 4,014,568.
Dear, Robert Ernest Arthur; and Kleiner, Eduard Karl, 4,014,926.
Fischer, Hanspeter, 4,014,677.
Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,014,920.
Karlen, Urs; and Morawietz, Hans, 4,014,906.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,015,000.
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,014,871.
Kubba, Ved Parkash, 4,014,864.
Meyer, Hans Rudolf, 4,014,644.
Meyer, Hans Rudolf, 4,014,870.
Peter, Heinrich; Muller, Beat; Sibral, Walter; and Bickel, Hans, 4,014,874.
Randell, Donald Richard; Holt, Brian; and Virgin, Alan Geoffrey, 4,014,887.
Schaffner, Karl; Meisels, Alex; Roger, Jean Claude; and Weis, Claus D., 4,015,007.
Stockinger, Friedrich; and Lohse, Friedrich, 4,014,824.
Citizens and Southern National Bank, The: *See—*
Painter, Perry J., 4,014,407.
City of Sioux City, Iowa: *See—*
Ahlquist, Melvin J., 4,014,534.
Clachan, Margaret Loudon; Kennedy, David Rankine; Shephard, Basil Robert, deceased; and by Shephard, Doreen, executrix, to Imperial Chemical Industries Limited. Process of making diazo-sensitized film products using halogen containing phenols as coating aid. 4,014,701, Cl. 96-75.000.
Clamco Corporation: *See—*
Lynch, William C., 4,014,229.
Clancy, James Roger; and Cook, Kenneth, to Henry Simon Limited. Pneumatic conveying systems. 4,014,577, Cl. 302-35.000.
Clare, Norval D.; and Lemke, Charles H., to Du Pont de Nemours, E. I., and Company. Process for making magnesium metal. 4,014,687, Cl. 75-67.00R.
Clark, Harold E., to Xerox Corporation. Electroviscous recording. 4,014,693, Cl. 96-1.00R.
Clark, William E., to Carrier Corporation. Air conditioning system. 4,014,381, Cl. 165-2.000.
Clarke, Charles W. Unique mechanical foot massager. 4,014,325, Cl. 128-57.000.
Clarke, Graham Morley, to Ferranti, Limited. Detection of faults in a predetermined area of a surface. 4,014,615, Cl. 356-200.000.
Clavier, Christian M., to Schlumberger Technology Corporation. Method and apparatus for determining permeable zones in subsurface earth formations. 4,015,197, Cl. 324-10.000.
Cleary, John M.; and Mohrhauser, John P. Controlled duration switch. 4,015,139, Cl. 307-141.000.

Cleaver, Brian; and Rowlands, Geoffrey John, to National Research Development Corporation. Electrolytic cells. 4,015,054, Cl. 429-104.000.

Clevepak Corporation: *See—*
Mauger, David W., 4,014,232.

Cline, Lawrence R.; and Hogg, Theodore B., to Caterpillar Tractor Co. Mounting arrangement for detachably coupling a vehicle frame to a ground-engaging undercarriage. 4,014,400, Cl. 180-9.20R.

Clinton Supply Company: *See—*
Cooperman, Seymour A., 4,015,184.

Clot, Jean: *See—*
Lagasse, Jean; Clot, Jean; Falipou, Jean; Loubieres, Andre; Rabischong, Pierre; Richard, Jean-Pierre; and Bui, Ai, 4,014,217.

Clothier, George Ernest; Davies, Robert Lewis; Hockey, John Albert; and Metcalfe, John Leonard, to Lever Brothers Company. Product for treating fabric. 4,014,432, Cl. 206-0.500.

Clow Corporation: *See—*
Anderson, Richard H., 4,014,556.

Cluff, Kenneth C.; and Bruce, Larry L. Blood sampling and infusion chamber. 4,014,328, Cl. 128-214.00R.

Coal Industry (Patents) Limited: *See—*
Andrews, John Frederick Collett; Budzinski, Edward Stanislaw; and Pearson, David Henry, 4,015,138.
Fox, Edward James, 4,014,255.
Monks, Harry, 4,014,413.
Page, Dennis, 4,015,124.
Thorp, Peter; and Bycroft, George William, 4,014,569.

Coate, Forrest M.: *See—*
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Coble Incorporated: *See—*
Coble, Ralph A., 4,014,564.

Coble, Ralph A., to Coble Incorporated. Vehicle stabilizing apparatus. 4,014,564, Cl. 280-689.000.

Coca-Cola Co., The: *See—*
Harvill, William Andrew, 4,014,461.

Cocker, John Derek, to Glaxo Laboratories Limited. Substituted 3-hydroxy- or 3-oxo-cephams. 4,014,872, Cl. 260-243.00C.

Coes, Loring, Jr., to Norton Company. Method and apparatus for grinding at a constant metal removal rate. 4,014,142, Cl. 51-165.770.

Colbert, Otto F.: *See—*
Shooter, Donald H.; and Colbert, Otto F., 4,014,139.

Cole, Edward L.: *See—*
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,014,661.

Cole, Henry B., to American Optical Corporation. Optical systems and associated detecting means. 4,015,120, Cl. 250-216.000.

Colgate-Palmolive Company: *See—*
Furgal, Henry P.; and Larsen, Ingrid A., 4,014,105.
Karami, Hamzeh, 4,014,341.
Schaar, Charles H., 4,014,338.

Colville, Larry L.: *See—*
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Combustion Engineering, Inc.: *See—*
Klein, Herschel A.; and Bozzuto, Carl R., 4,014,978.

Comer, William T.: *See—*
Kreighbaum, William E.; and Comer, William T., 4,015,006.

Commissariat a l'Energie Atomique: *See—*
Lions, Noel, 4,014,295.

Comstock & Wescott, Inc.: *See—*
Green, Harold W., 4,014,287.

Concannon, Thomas Patrick, to Du Pont de Nemours, E. I., and Company. Aqueous solutions of polyamide acids which can be precursors of polyimide polymers. 4,014,834, Cl. 260-29.20N.

Concept, Inc.: *See—*
Staub, David Edward; Foltz, Carl Leroy; and Simmons, Raymond Walter, 4,014,342.

Cone, Gail P.: *See—*
Kurpanek, Horst G.; and Cone, Gail P., 4,015,243.

Congoleum Corporation: *See—*
Haemer, Laurence F., 4,015,036.

Connor, David; Cuciti, Francesco; and Lowe, Edward James. Novel organopolyphosphates in aqueous cleaning compositions. 4,014,806, Cl. 252-110.000.

Consort Project Development Limited: *See—*
Joyce, Donald James, 4,014,490.

Conti, Paolo; and Bianchi, Massimo. Panty hose with improved waist openings. 4,014,188, Cl. 66-177.000.

Continental Oil Company: *See—*
Murphy, Charles L., 4,014,104.
Romine, Hugh E., 4,014,803.

Cook, Edward J. Method and apparatus for horticultural grafting. 4,014,132, Cl. 47-6.000.

Cook, Kenneth: *See—*
Clancy, James Roger; and Cook, Kenneth, 4,014,577.

Coons, Robert Arthur; Gipe, Richard Earl; and Marks, Richard Lee, to GTE Sylvania Incorporated. Apparatus and method for providing an electrical contact with a tip portion substantially free of burrs. 4,014,199, Cl. 72-294.000.

Cooper, Richard Roy; and Whiteley, Kenneth Stephenson, to Imperial Chemical Industries Limited. Production of polyethylene. 4,014,859, Cl. 526-65.000.

Cooperman, Seymour A., to Clinton Supply Company. Silicon junction diode rectifier power pack. 4,015,184, Cl. 321-8.00C.

Copeland, Leigh: *See—*
Meyer, Burton C.; and Copeland, Leigh, 4,014,251.

Corcoran, Donald Gerald, to International Telephone and Telegraph Corporation. Picture phone. 4,015,115, Cl. 250-199.000.

Corneau, George E.: *See—*
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Corneliuz, David R.: *See—*
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Cornell, Paul A.: *See—*
Cornell, Paul V.; and Cornell, Paul A., 4,014,078.

Cornell, Paul V.; and Cornell, Paul A., to Electro-Clamp Corporation. Clamping device with adjusting ring. 4,014,078, Cl. 24-132.00R.

Cornell Research Foundation, Inc.: *See—*
Millier, William F.; Rehkugler, Gerald E.; Pellerin, Roger A.; and Throop, James A., 4,014,440.
Resler, Edwin L., Jr., 4,015,161.

Corning Glass Works: *See—*
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Simon, Raphael A., 4,014,968.

Corr, Hubert: *See—*
Boettger, Guenther; Corr, Hubert; Hoffmann, Herwig; Toussaint, Herbert; and Winderl, Siegfried, 4,014,933.

Corson, Frederick P.: *See—*
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,014,854.

Costin, Darryl J., to Owens-Corning Fiberglas Corporation. Platinum-rhodium alloys having low creep rates. 4,014,692, Cl. 75-172.00R.

Costin, Robert W., to Lear Siegler, Inc. Tilting seatback adjustment mechanism. 4,014,593, Cl. 297-367.000.

Cote, Paul T., to General Electric Company. Photoflash array having electrical shorting means. 4,015,093, Cl. 200-51.100.

Cotton de Bennetot, Michel, to Le Materiel Magnetique. Devices for magnetic control with permanent magnets. 4,015,174, Cl. 361-153.000.

Coughlin, Warren J.; and Fecci, Renato D. Collapsible and disposable sanitary pet litter container. 4,014,292, Cl. 119-1.000.

Coulter Electronics, Inc.: *See—*
Simpson, Ronald O.; and Godin, Thomas J., 4,014,611.

Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 4,014,779.

Courboulay, Pierre: *See—*
Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, 4,015,242.

Cover, William S.; and Haller, Jacob S., to TRW Inc. Wire termination apparatus. 4,014,087, Cl. 29-721.000.

Cox, Robert William: *See—*
Jones, Derek Arthur; and Cox, Robert William, 4,014,316.

Cox, William L., to Platt Saco Lowell Corporation. Stop-motion device for automatic doffer apparatus. 4,014,161, Cl. 57-52.000.

Craig, Evelyn R. Disposable cuff protector. 4,014,046, Cl. 2-60.000.

Cramer, Roy A., Jr. Liquid moving and mixing apparatus. 4,014,526, Cl. 259-24.000.

Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., to Electroprint, Inc. Method and apparatus for forming a positive electrostatic image. 4,014,694, Cl. 96-1.00R.

Cretin, Jacques: *See—*
Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, 4,015,242.

Critendon, Morris K. Orifice fitting conversion apparatus. 4,014,366, Cl. 138-44.000.

Crnogorac, Ferdo. Watercraft, particularly for watersports. 4,014,283, Cl. 115-70.000.

Crosby, John; Rennie, Robert Allan Campbell; Tanner, John; and Paton, Robert Michael, to Imperial Chemical Industries Limited. 3,4-Cycloalkano furoxans. 4,014,893, Cl. 260-307.0DB.

Crosfield Electronics Limited: *See—*
Dalton, Brian L., 4,015,221.

Crown Zellerbach Corporation: *See—*
Reba, Imants; and Hogland, Gerald Hugh, 4,014,487.

Crutchfield, Marvin M.; and Maier, Ludwig, to Monsanto Company. Phosphonoether carboxylates. 4,014,959, Cl. 260-942.000.

Cuciti, Francesco: *See—*
Connor, David; Cuciti, Francesco; and Lowe, Edward James, 4,014,806.

Cunningham, Wade K.: *See—*
Hart, David R.; and Cunningham, Wade K., 4,014,827.

Currie, James H.: *See—*
Rishavy, Edward A.; and Currie, James H., 4,014,297.

Cusano, Dominic A., to General Electric Company. Method for forming an improved contact for a radiation switch. 4,015,028, Cl. 427-58.000.

Cyrot, Luc, to D.B.A. Servomechanism controlled step by step. 4,014,248, Cl. 91-19.000.

Cywar, Sigmund. Blackjack card deck. 4,014,549, Cl. 273-152.410.

D.B.A.: *See—*
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Dai Nippon Toryo Kabushiki Kaisha: *See—*
Totani, Kazuo; Matsumoto, Goro; Iwasaki, Kazuhito; and Jinnai, Toshio, 4,014,811.

Daieigiken, Inc.: *See—*
Ohkawa, Nobuyoshi, 4,014,254.

Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Furuya, Kiyoto, 4,014,773.

Daikeler, Wolfgang; and Exner, Klaus Uwe, to Dornier GmbH. Towed craft for representing aerial targets. 4,014,481, Cl. 244-3.000.

D'Aillon, Francois-Gros: *See—*
Gagnon, Marcel; Baril, Michel; D'Aillon, Francois-Gros; and Savoie, Claude, 4,015,121.

Daimler-Benz Aktiengesellschaft: *See—*
Happel, Robert, 4,014,301.
Dalton, Brian L., to Crosfield Electronics Limited. Preparation of gravure printing surfaces. 4,015,221, Cl. 332-7.510.
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Eilingsfeld, Heinz; and Naarmann, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Dioxazolone group-containing polymers. 4,015,062, Cl. 526-260.000.

Eisele, Franz, to Wurttembergische Metallwarenfabrik. Sheet metal shears for metal sheets and plates with a highly sensitive surface. 4,014,230, Cl. 83-86.000.

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Fairand, Barry P.: *See—*
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Falipou, Jean: *See—*
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Falstad, William J.: *See—*
Ludlum, Lorren F., 4,014,288.
Fargo, Harland E., to Owens-Corning Fiberglas Corporation. Production of glass fiber products. 4,014,726, Cl. 156-167.000.
Favara, Duccio: *See—*
Johnson, Francis; Paul, Kenneth G.; and Favara, Duccio, 4,014,919.
Favre, Robert, to Etat de Vaud. Intercranial pressure transducer. 4,014,319, Cl. 128-2.00R.
Fawcett Engineering Limited: *See—*
Read, Brian, 4,014,284.
Faye, Lloyd Henry. Adjustable hinged bracket for a drain trough. 4,014,074, Cl. 16-135.000.
Fecci, Renato D.: *See—*
Coughlin, Warren J.; and Fecci, Renato D., 4,014,292.
Fechtig, Bruno: *See—*
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,015,000.
Federal-Mogul Corporation: *See—*
Probst, Robert L.; and Fairand, Barry P., 4,014,964.
Feigel, Norman J., to International Harvester Company. Tractive effort selector. 4,014,220, Cl. 74-522.000.
Feiler, William A.; and Stahlheber, Norman Earl, to Monsanto Company. Carboxy methoxy malonate. 4,014,930, Cl. 260-535.00P.
Felci, Eustorgio: *See—*
Magnaghi, Sergio; Felci, Eustorgio; and Ferrari, Rodolfo, 4,014,994.
Feldman, Martin L.; and Miller, Robert S., to Tenneco Chemicals, Inc. Manufacture of polyvinyl chloride of low vinyl chloride monomer content. 4,015,064, Cl. 528-491.000.
Feldman, Nicholas; and Langer, Arthur W., Jr., to Exxon Research and Engineering Company. Synergistic low temperature flow improver in distillate fuel. 4,014,663, Cl. 44-71.000.
Feller, Herman H.: *See—*
Shanahan, Francis V.; and Feller, Herman H., 4,015,176.
Ferguson, George R., to Duff-Norton Company, Inc. Dishwasher and coupling. 4,014,467, Cl. 239-261.000.
Ferlazzo, Natale; Buzzi, Gian Fausto; Ghirga, Marcello; and Calcagno, Benedetto, to Societa' Italiana Resine S.I.R. S.p.A. Process for preparing methyl acrylate or mixtures of methyl acrylate and acrylic acid. 4,014,925, Cl. 260-486.00R.
Ferraguti, Luigi, to Matec S.p.A. Method of forming a closed end on a knitted tubular fabric. 4,014,186, Cl. 66-95.000.
Ferranti, Limited: *See—*
Clarke, Graham Morley, 4,014,615.
Ferrari, Harry. Method of producing string of polyamide and stringed rackets and stringed musical instruments with such strings. 4,015,133, Cl. 250-492.00R.
Ferrari, Rodolfo: *See—*
Magnaghi, Sergio; Felci, Eustorgio; and Ferrari, Rodolfo, 4,014,994.
Fetter, Richard W., to United States of America, Navy. Radar detection of turbulence in precipitation. 4,015,257, Cl. 343-5.00W.
Feustel, James R.; and Rhodes, Alex, to Ford Motor Company. Steering shaft coupling. 4,014,219, Cl. 74-492.000.
Fiat Societa per Azioni: *See—*
Husse, Massimo; and Lagonigro, Mauro, 4,014,210.
Rivolo, Pier Franco, 4,014,304.
Fichtel & Sachs A.G.: *See—*
Riese, Hans-Walter, 4,014,420.
Werner, Karl-Heinz; Baron, Gerhard; and Fadler, Kurt, 4,014,423.
Fieni, Walter, to Societe Anonyme Francais du Ferodo. Safety belt installation for motor car. 4,014,565, Cl. 280-744.000.
Figueroa, David C.; and Corneliuz, David R. Protective device. 4,014,044, Cl. 2-2.000.
Fink, Leonhard, to Thyssen Plastik Anger KG. Apparatus and process for drawing water from a water-bearing strata. 4,014,387, Cl. 166-314.000.
Fink, Roger H.; and Porter, William D., to Akzona Incorporated. String up and shutdown process for a yarn texturizing apparatus. 4,014,085, Cl. 28-72.140.
Finkenbiner, William G.: *See—*
Wells, Larry L.; and Finkenbiner, William G., 4,014,205.
Firestone Tire & Rubber Company, The: *See—*
Schulz, Donald Norman; and Halasa, Adel Farhan, 4,015,061.
Firmenich S.A.: *See—*
Demole, Edouard, 4,014,350.
Naf, Ferdinand; Ohloff, Gunther; and Eschenmoser, Albert, 4,014,951.
Skorianetz, Werner; Renold, Walter; Ohloff, Gunther; and Schulte-Elte, Karl-Heinrich, 4,014,905.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, administratrix);

Rohr, Wolfgang; and Reitel, Christian, to BASF Aktiengesellschaft. Substituted dihydro benzofuranyl esters. 4,014,904, Cl. 260-346.20R.

Fischer, Caecilia Emma, administratrix: *See*—
Fischer, Adolf, deceased; Rohr, Wolfgang; and Reitel, Christian, 4,014,904.

Fischer, Ernst; Lorenz, Roland; and Rehder, Ludwig, to U.S. Philips Corporation. Metallic halide high-pressure gas discharge lamp. 4,015,164, Cl. 313-223.000.

Fischer, Hanspeter, to Ciba-Geigy Corporation. 5-Nitropyrimidine derivatives and their use in agents for influencing plant growth. 4,014,677, Cl. 71-92.000.

Fischler, Hans-Michael: *See*—
Kaiser, Bernd-Ulrich; Dhein, Rolf; Kuchenmeister, Rolf; and Fischler, Hans-Michael, 4,014,708.

Fishburn, Robert Anthony: *See*—
Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, 4,014,684.
Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, 4,014,685.

Fisher, Richard Lawrence: *See*—
Demaine, David George Anthony; Archer, John David; and Fisher, Richard Lawrence, 4,015,235.

Fisher, Robert C. Inertia locking seat belt retractor. 4,014,480, Cl. 242-107.40A.

Fisk, Bernard C.: *See*—
VerSchage, Gerald C.; Fisk, Bernard C.; and Donohue, James M., 4,014,609.

Fisons Limited: *See*—
Carter, Peter Laurence, 4,014,917.

Fitch, Harold G., to American Chain & Cable Company, Inc. Conveyor chain structure. 4,014,267, Cl. 104-172.00C.

Fletcher, Gerald M., to Xerox Corporation. Transfer system with tailored illumination. 4,014,605, Cl. 355-3.00R.

Florida Pneumatic Manufacturing Corporation: *See*—
Taylor, James O., 4,014,249.

Flournoy, Norman E.: *See*—
Barnes, Vernon M., Jr.; Flournoy, Norman E.; and Horton, Eugene B., Jr., 4,015,270.

FMC Corporation: *See*—
Castrantas, Harry Marcus, 4,014,805.
Dounchis, Harry, 4,014,943.
Leigh, Theodore M., 4,014,519.
Wilson, Donald C., 4,014,153.

Folser, Karl: *See*—
Theurer, Josef; and Folser, Karl, 4,014,389.

Foltz, Carl Leroy: *See*—
Staub, David Edward; Foltz, Carl Leroy; and Simmons, Raymond Walter, 4,014,342.

Food Technology Products: *See*—
Glabe, Elmer F.; and Rebhan, Herbert J., 4,015,018.

Forbes, Arthur A. Automobile bump protector. 4,014,583, Cl. 293-62.000.

Ford Motor Company: *See*—
Feustel, James R.; and Rhodes, Alex, 4,014,219.
Pierce, Stanley L., Jr., 4,014,223.

Fork, Kurt, to Kraftwerk Union Aktiengesellschaft. System for limiting torque in a turbine-generator shaft. 4,015,186, Cl. 322-8.000.

Foseco International Limited: *See*—
Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, 4,014,684.
Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, 4,014,685.

Fox, Edward James, to Coal Industry (Patents) Limited. Apparatus for use in determining the character of finely divided or particulate solid material. 4,014,255, Cl. 100-99.000.

Foxworthy, Milton Kearney; Huston, John Timothy; and Ziels, Burton Davis, to Diamond Power Specialty Corporation. Nuclear control rod position indicating assembly. 4,014,741, Cl. 176-19.0EC.

France Bed Co., Ltd.: *See*—
Kosakai, Tamajiro, 4,014,273.
Kosakai, Tamajiro, 4,014,274.

Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See*—
Theurer, Josef; and Folser, Karl, 4,014,389.

Franz, William F.: *See*—
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,014,661.

Franzer, Wolfgang, to Dr. C. Otto & Comp. G.m.b.H. Support apparatus for a battery of coke ovens. 4,014,750, Cl. 202-139.000.

Frechin, Lucette, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Method for preparing fibrous metal materials by electrolytic deposition and the resulting fibrous metal material. 4,014,757, Cl. 204-27.000.

Fredriksson, Oke A.; and Thomas, Elmer L., to Chevron Research Company. Automatic measurement and display of resonance frequencies of seismic detection elements. 4,015,202, Cl. 324-57.000Q.

Freeman Supply Company, The: *See*—
Rusk, Gerald R.; and Koch, Robert E., 4,014,090.

French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, to Occidental Petroleum Corporation. System for fuel and products of oil shale retort. 4,014,575, Cl. 299-2.000.

Frenken, Hans: *See*—
Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Bussmann, Heinz; Voss, Karl; Schaffer, Helmut; and Junkersdorf, Willi, 4,014,491.

Friedrich, Dieter: *See*—
Schreiner, Horst; and Friedrich, Dieter, 4,014,660.

Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Recirculating vortex burner. 4,014,639, Cl. 431-353.000.

Fromson, Howard A. Process for making metal powders. 4,014,756, Cl. 204-10.000.

Frye, John S.; and Fuss, James B. Fastener. 4,014,245, Cl. 85-5.00P.

Fryer, Rodney Ian; Ning, Robert Ye-Fong; Sternbach, Leo Henryk; and Walser, Armin, to Hoffmann-La Roche Inc. Indoloquinolines, intermediates and processes. 4,014,883, Cl. 260-288.0CF.

Fryer, Rodney Ian: *See*—
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,014,916.

Fuchs, Julius J.; and Lin, Kang, to Du Pont de Nemours, E. I., and Company. Alkyl-4-alkyl-N-alkoxycarbonyl-1-thioallophanimidate. 4,014,924, Cl. 260-481.00C.

Fuchs, Werner; Platz, Rolf; Rieber, Norbert; and Scholz, Andreas, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Propylene oxide recovery by azeotropic distillation of methyl formate-2-methylpentane. 4,014,753, Cl. 203-1.000.

Fudge, William L., to Larsen's Manufacturing Company. Alarm for removal of a fire extinguisher. 4,015,250, Cl. 340-280.000.

Fuji Electric Company Ltd.: *See*—
Takezoe, Fumihiko, 4,015,241.

Fuji Photo Film Co., Ltd.: *See*—
Fujita, Shinsaku; Maekawa, Yukio; Sano, Kazuya; and Sakanoue, Seiki, 4,014,700.
Hinata, Masanao; Ohki, Masanaga; Takei, Hartuo; Sato, Akira; and Ogawa, Akira, 4,014,702.
Sasazawa, Koji; Yamada, Yasuyuki; Kitamoto, Tatsuji; and Akashi, Goro, 4,015,030.

Fujikawa, Nagao, to Murata Manufacturing Co., Ltd. Semiconductor ceramic composition. 4,014,822, Cl. 252-520.000.

Fujimaki, Hiroto; Hayashi, Haruhisa; and Kawahara, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Method for manufacturing graphite whiskers using condensed polycyclic hydrocarbons. 4,014,980, Cl. 423-448.000.

Fujimoto, Manabu: *See*—
Sumimoto, Shinzaburo; Tochino, Yoshihiro; and Fujimoto, Manabu, 4,014,876.

Fujimoto, Yoshiji; and Kadota, Shozo, to Hitachi, Ltd. Character recognition apparatus. 4,015,239, Cl. 340-146.30H.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Itoh, Masumi, 4,014,915.

Fujita, Kazumasa, to Motorola, Inc. Change-over switch mechanism for push-button tuner. 4,015,096, Cl. 200-156.000.

Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece including battery monitoring arrangement. 4,014,164, Cl. 58-23.0BA.

Fujita, Seigoro: *See*—
Watanabe, Noritoshi; Fujita, Seigoro; Shibata, Kazuo; Iwawaki, Shiho; and Takeda, Hiromu, 4,015,043.

Fujita, Shinsaku; Maekawa, Yukio; Sano, Kazuya; and Sakanoue, Seiki, to Fuji Photo Film Co., Ltd. Furan containing azo dye developers. 4,014,700, Cl. 96-73.000.

Fujitsu Ltd.: *See*—
Fukuta, Masumi, 4,015,278.

Fujitsu Ten Ltd.: *See*—
Takatani, Masayoshi; and Amaya, Yuji, 4,015,237.

Fujiwara, Shinobu: *See*—
Tanaka, Hitoshi; Masumura, Hitoshi; and Fujiwara, Shinobu, 4,014,707.

Fukami Co., Ltd.: *See*—
Fukami, Toshihiro, 4,014,235.

Fukami, Toshihiro, to Fukami Co., Ltd. Apparatus for bandsawing operation with profiling mechanism capable of automatic copying of a model. 4,014,235, Cl. 83-565.000.

Fukuta, Masumi, to Fujitsu Ltd. Field effect semiconductor device. 4,015,278, Cl. 357-22.000.

Fulghum Industries, Inc.: *See*—
McKnight, Jimmy, 4,014,419.

Fullinwider, James H.; and Knight, Bruce L., to Marathon Oil Company. Process for breaking polymer-containing emulsions. 4,014,801, Cl. 252-8.55D.

Funke, Peter, to ISPOW AG. Ski pole assembly. 4,014,559, Cl. 280-11.37N.

Furgal, Henry P.; and Larsen, Ingrid A., to Colgate-Palmolive Company. Article, apparatus and method for conditioning fibrous materials with liquid conditioning composition. 4,014,105, Cl. 34-12.000.

Furukawa, Masamichi: *See*—
Takahashi, Akira; and Furukawa, Masamichi, 4,015,274.

Furuno, Sentaro. Small synchronous motor with lash coupling. 4,015,153, Cl. 310-41.000.

Furuya, Kiyoto, to Daiichi Denshi Kogyo Kabushiki Kaisha. Apparatus for electrolytic treatment. 4,014,773, Cl. 204-206.000.

Furuya, Osamu; Wada, Koichi; Hosaki, Yoshihiko; and Mihara, Nobutake, to Showa Denko Kabushiki Kaisha. Process for purifying α-amino acids. 4,014,928, Cl. 260-534.00R.

Fuss, James B.: *See*—
Frye, John S.; and Fuss, James B., 4,014,245.

Gabernig, Heinz: *See*—
Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, 4,014,752.

GAF Corporation: *See*—
Berni, Rene P.; Lorenz, Donald H.; and Williams, Earl Pierce, 4,014,754.

Gagnon, Marcel; Baril, Michel; D'Aillon, Francois-Gros; and Savoie, Claude, to Allca Instruments Co. Ltd. Catalsimeter with time measuring circuitry for determining reactant concentration level. 4,015,121, Cl. 250-221.000.
Gagnon, Regis: *See—*
Seniuk, William; and Gagnon, Regis, 4,015,099.
Gale, Jack D., to Tubbs, Clare P. Adaptor for converting an L-shaped rod into an earth anchor. 4,014,144, Cl. 52-157.000.
Galer, Herbert W., to United States Steel Corporation. Plastic lids and pails. 4,014,452, Cl. 220-74.000.
Gall, Walter George, to Du Pont de Nemours, E. I., and Company. Abrasion resistant fluoroolefin coating composition. 4,015,057, Cl. 526-30.000.
Galtz, Charles S. Temperature set back. 4,014,500, Cl. 236-46.00R.
Gamble, Fred R., Jr.; and Levy, Ricardo B., to Exxon Research and Engineering Company. Removal of carbon and vanadium or lead from spent catalysts by means of controlled high temperature treatment with sulfur. 4,014,815, Cl. 252-412.000.
Gamble, George W. Synthetic woodwind reed. 4,014,241, Cl. 84-383.00A.
Game Time, Inc.: *See—*
Caulkins, Ted L., 4,014,540.
Garber, Murray; Ross, Lawrence James; and Stepek, Walter Joseph, to American Cyanamid Company. Catalytic dehydrogenation process for the preparation of 3,4,5-trisubstituted pyrazoles. 4,014,896, Cl. 260-310.00R.
Gardineer, Bayard G., Jr.: *See—*
Druschel, William O.; Gardineer, Bayard G., Jr.; Manning, Stanley A.; and Musits, Bela, 4,014,576.
Garner, Edward, to Imperial Chemical Industries Limited. Smoking mixture. 4,014,348, Cl. 131-2.000.
Garrett Corporation, The: *See—*
Iles, Thomas L.; Hwang, Kwang-Chou; and Kinsell, Robert C., 4,014,179.
Garrett, Terry N. Dental flossing tool. 4,014,354, Cl. 132-90.000.
Gas Developments Corporation: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,014,380.
Gasparini, Mauro: *See—*
Girotti, Floriano; and Gasparini, Mauro, 4,014,450.
Gasser, Lorenz; and Szechenyi, Kalman, to International Standard Electric Corporation. Controllable negative resistance electronic switch arrangement. 4,015,190, Cl. 323-4.000.
Gavagan, James A.; and Petersen, Carl Mogens, III, to Irvin Industries, Inc. Safety seat belt buckle switch with coil spring contact. 4,015,094, Cl. 200-61.58B.
Gawlick, Heinz; and Marondel, Guenther, to Dynamit Nobel Aktiengesellschaft. Molding a primer charge within a caseless propellant charge. 4,014,963, Cl. 264-3.00R.
Gawlick, Heinz: *See—*
Bendler, Hellmut; and Gawlick, Heinz, 4,014,264.
Gazave, Jean-Maurice; Rancurel, Alain; and Grenier, Georges, to Laboratoires Pharmascience. Certain biphenyl derivatives used to treat disorders caused by increased capillary permeability. 4,015,017, Cl. 424-331.000.
Gedenk, Rudolf: *See—*
Pusch, Gunter; and Gedenk, Rudolf, 4,014,721.
Geiger, Rolf; and Obermeier, Rainer, to Hoechst Aktiengesellschaft. Process for the manufacture of insulin, analogs and derivatives thereof. 4,014,861, Cl. 260-112.700.
General Electric Company: *See—*
Bluestein, Ben A., 4,014,851.
Cote, Paul T., 4,015,093.
Cusano, Dominic A., 4,015,028.
Elsworth, Robert M., 4,014,629.
Erdman, David M., 4,015,182.
Milkovic, Miran, 4,015,140.
Preston, John M., 4,014,715.
Roller, Robert S.; Holcomb, Richard H.; and Danko, George K., 4,015,157.
Roller, Robert S.; Holcomb, Richard H.; and Danko, George K., 4,015,158.
General Electric Company Limited, The: *See—*
Samuels, Philip Rufus, 4,015,167.
General Foods Corporation: *See—*
Szczesniak, Alina Surmacka, 4,015,025.
General Motors Corporation: *See—*
Deming, Kenneth R., 4,015,109.
Klomp, Edward D., 4,014,300.
Matter, Robert C.; and Spangler, Larry D., 4,015,098.
Rishavy, Edward A.; and Currie, James H., 4,014,297.
Strandt, Earl R., 4,015,254.
General Time Corporation: *See—*
Lundin, Robert S.; and Carragan, John F., 4,015,193.
Genese, Joseph Nicholas, to Abbott Laboratories. Disposable two-compartment syringe. 4,014,330, Cl. 128-218.00M.
Gerster, John F., to Riker Laboratories, Inc. Substituted benzo[ij]-quinolizine-2-carboxylic acids and derivatives thereof. 4,014,877, Cl. 260-247.5GP.
Gertsch AG: *See—*
Weigl, Erwin; and Svoboda, Josef, 4,014,563.
Gessler, Albert M.; and Baldwin, Francis P., to Exxon Research and Engineering Company. Covulcanization of conjugated diene-containing butyl with halobutyl and butyl rubber. 4,014,852, Cl. 260-42.350.
Getselev, Zinovy Naumovich. Method of forming ingot in process of continuous and semi-continuous casting of metals. 4,014,379, Cl. 164-4.000.
Ghirga, Marcello: *See—*
Ferlazzo, Natale; Buzzi, Gian Fausto; Ghirga, Marcello; and Calcagno, Benedetto, 4,014,925.
Giacopelli, Umberto, to Solvay & Cie. Electrolytic apparatus. 4,014,776, Cl. 204-257.000.
Gianos, Edward A.; Hunter, H. Eric; and Lazo-Wasem, Edgar A., to Denver Chemical Manufacturing Company. Micro-filter. 4,014,653, Cl. 23-259.000.
Gijzen, Wilhelmus Adrianus Henricus; and Potma, Theodorus Gerhardus, to U.S. Philips Corporation. Recording element for a matrix printer. 4,014,425, Cl. 197-1.00R.
Gilbert, Saul: *See—*
Bassett, James G., Jr.; and Gilbert, Saul, 4,014,686.
Gilim, Alexandr Sergeevich: *See—*
Barakaev, Khristofor Fedorovich; Gilim, Alexandr Sergeevich; Stukachev, Anatoly Viktorovich; and Shulga, Robert Nikolaevich, 4,015,170.
Gillemot, George W., to Thompson, John T., a part interest. Re-enterable cable splice enclosure and kit including re-closable tubular housing and end caps. 4,015,072, Cl. 174-92.000.
Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, to AGFA-GEVAERT, N.V. Liquid electrophotographic developers. 4,014,856, Cl. 252-62.10L.
Gilmer, James Ray; Bowers, Harry Alvin; and Day, Robert Earl. Electrotherapy system. 4,014,323, Cl. 128-2.10Z.
Gipe, Richard Earl: *See—*
Coons, Robert Arthur; Gipe, Richard Earl; and Marks, Richard Lee, 4,014,199.
Girault, Pierre: *See—*
Perronnet, Jacques; and Girault, Pierre, 4,014,679.
Girotti, Floriano; and Gasparini, Mauro, to Montefibre S.p.A. Packaging container. 4,014,450, Cl. 220-4.00E.
Gisewsky, Karl-Robert. Self-cleaning device for detachably connecting electrical conductor wires. 4,014,600, Cl. 339-48.000.
Gist, Lanny J. Retractable chair for small children. 4,014,592, Cl. 297-143.000.
Gittings, Robert S., to Gold Medal, Inc. Collapsible chair. 4,014,591, Cl. 297-55.000.
Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Products. Silage process and product. 4,015,018, Cl. 426-2.000.
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich. Cold butt-welding machine. 4,014,494, Cl. 228-3.100.
Glaxo Laboratories Limited: *See—*
Cocker, John Derek, 4,014,872.
Gregory, Gordon Ian; Gregson, Michael; and Webb, Godfrey Basil, 4,014,869.
Glory Kogyo Kabushiki Kaisha: *See—*
Izawa, Tsuyoshi; and Itoda, Masaru, 4,014,155.
Gnanamuthu, Daniel S.; and Locke, Edward V., to Avco Everett Research Laboratory, Inc. Surface modification. 4,015,100, Cl. 219-121.0LM.
Go-Jo Industries, Inc.: *See—*
Robinson, Ronald L., 4,014,459.
Godin, Thomas J.: *See—*
Simpson, Ronald O.; and Godin, Thomas J., 4,014,611.
Gold Medal, Inc.: *See—*
Gittings, Robert S., 4,014,591.
Golden, Harold. Attache cases. 4,014,416, Cl. 190-42.000.
Goldstein, Richard, to Dynascan Corporation. Rotary digital channel selection apparatus. 4,015,253, Cl. 340-347.00P.
Goldsworthy, Forrest C. Apparatus employing a timer for controlling the quantity of water flushed by a toilet. 4,014,050, Cl. 4-67.00A.
Golla, Edward Dale: *See—*
Thornton, Joseph Scott; and Golla, Edward Dale, 4,014,216.
Goloff, Alexander, to Caterpillar Tractor Co. Heat pipe cooling of a rotary engine rotor. 4,014,631, Cl. 418-85.000.
Golz, Reinhard Heinz; and Johnson, William James, to B. F. Goodrich Company, The. Pneumatic tire mold. 4,014,632, Cl. 425-28.00R.
Gomez, Charles: *See—*
Gomez, Edward; and Gomez, Charles, 4,014,547.
Gomez, Edward; and Gomez, Charles. Mathematical board game. 4,014,547, Cl. 273-134.00C.
Gonzalez, Jesus: *See—*
Lupia, Arthur W.; Gonzalez, Jesus; and Thurman, Garrett, 4,014,197.
Good, William K.; and Harbage, Wilson J., to Koppy Corporation. Retainer ring and splined member assembly. 4,014,619, Cl. 403-359.000.
Goodwill Industries of Chicago and Cook County: *See—*
Hester, Edward J., 4,014,108.
Goodwin, Eber Lyle, to Addressograph Multigraph Corporation. Angular path sheet conveying. 4,014,539, Cl. 271-184.000.
Goralski, Christian T., to Dow Chemical Company, The. Process of making di or tribromomethanesulfonamides. 4,014,875, Cl. 260-247.10R.
Goralski, Christian T.; and Burk, George A., to Dow Chemical Company, The. Process for making aryl chloromethyl sulfides. 4,014,891, Cl. 260-302.0SD.

Gorbaty, Martin L.: *See*—
Li, Norman N.; Singhal, Gopal H.; Minday, Richard M.; and Gorbaty, Martin L., 4,014,785.

Gorden, Dale I., to Westinghouse Electric Corporation. Supplemental field excitation for permanent magnet rotor of pilot exciter. 4,015,189, Cl. 322-46.000.

Gordon, David L.: *See*—
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Goretta, Louis A.: *See*—
Svarz, Jerry J.; Goretta, Louis A.; and Seale, Virgil L., 4,014,820.

Gorter, Werner; Kresta, Erich; and Stumpf, Horst, to Semperit Aktiengesellschaft. Method of making a molded article with oriented fiber reinforcements. 4,014,969, Cl. 264-108.000.

Gossett, Charles W.; and Dauenhauer, William J. Air and light impervious water purification and product dispensing system. 4,014,792, Cl. 210-123.000.

Gotaverken Angteknik AB: *See*—
Astrom, Ingmar, 4,014,296.

Goto, Kenji; and Niwa, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburator for a stratified combustion engine with a prechamber. 4,014,960, Cl. 261-23.00A.

Gottschalk, Robert E. Apparatus for varying intensity of light. 4,015,113, Cl. 240-41.35R.

Goughnour, Roy Robert, to A. C. Aukerman Co. Adjustable slip form. 4,014,633, Cl. 425-63.000.

Graafsma, Richard S., to Auto Specialties Manufacturing Company. Snubber for one end lift jacks. 4,014,515, Cl. 254-2.00B.

Grace, Richard C.; and Rochow, Kenneth H., to Environment/One Corporation. Combined manway and collection tank for sewage grinder. 4,014,475, Cl. 241-36.000.

Grafulia, Fernando Cillero: *See*—
Letelier, Carlos Sunkel; and Grafulia, Fernando Cillero, 4,014,921.

Granberg, Frederick M., to International Paper Company. Mold construction having removable base member. 4,014,739, Cl. 162-274.000.

Granryd, Eric G. U. Method of improving refrigerating capacity and coefficient of performance in a refrigerating system, and a refrigerating system for carrying out said method. 4,014,182, Cl. 62-117.000.

Green, Harold W., to Comstock & Wescott, Inc. High speed fluid applicator. 4,014,287, Cl. 118-7.000.

Green, Paul James: *See*—
Mast, John George, Jr.; and Green, Paul James, 4,014,616.

Greenbaum, George. Modular channel culture device. 4,014,135, Cl. 47-86.000.

Greenberg, Jerome S., to Regal China Corporation. Fired ceramic bottle having threaded neck. 4,014,448, Cl. 215-31.000.

Greengate Industrial Polymers Limited: *See*—
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Greenspan, Donald J., to U.S. Medical Research and Development, Inc. Method of and apparatus for collecting cultures. 4,014,746, Cl. 195-103.50R.

Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Bussmann, Heinz; Voss, Karl; Schaffer, Helmut; and Junkersdorf, Willi, to AGFA-Gevaert, A.G. Arrangement for adjusting and measuring web tension levels. 4,014,491, Cl. 226-113.000.

Gregory, Gordon Ian; Gregson, Michael; and Webb, Godfrey Basil, to Glaxo Laboratories Limited. Cephalosporin derivatives. 4,014,869, Cl. 260-240.00J.

Gregory, Richard A., Jr.: *See*—
Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., 4,014,789.

Gregson, Michael: *See*—
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Grenier, Georges: *See*—
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Grenn, James F. Centrifugal pump means. 4,014,626, Cl. 415-102.000.

Gresko, William. Weight distribution measuring instruments. 4,014,398, Cl. 177-208.000.

Grier, John D.; and Taylor, Lynn J., to Owens-Illinois, Inc. Fugitive vehicle system. 4,014,845, Cl. 260-31.80R.

Griffin, Timothy L., Jr., to Amanita Sound, Incorporated. Speaker enclosures. 4,014,597, Cl. 312-7.00R.

Groff, Eugene R., to Caterpillar Tractor Co. Shoe assembly. 4,014,581, Cl. 305-54.000.

Grogan, Robert D., to Briggs & Stratton Corporation. Pillar lock. 4,014,195, Cl. 70-379.00R.

Grolman, Bernard: *See*—
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Gross, Jerome A.: *See*—
Malinski, S. W.; Mueller, Thomas L.; and Gross, Jerome A., 4,014,375.

Grott, Charles N.; and Rollins, Dallas W., to ACF Industries, Incorporated. Variable metering drop valve. 4,014,578, Cl. 302-52.000.

Groves, John L. Roof saddle. 4,014,145, Cl. 52-199.000.

Gryaznov, Vladimir Mikhailovich; Smirnov, Viktor Sergeevich; Mischenko, Alexandr Petrovich; and Aladyshev, Sergei Ivanovich. Catalytic-reactor for carrying out conjugate chemical reactions. 4,014,657, Cl. 23-288.00R.

Gschwend, Heinz Werner: *See*—
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GTE Lenkurt (Canada) Ltd.: *See*—
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GTE Sylvania Incorporated: *See*—
Coons, Robert Arthur; Gipe, Richard Earl; and Marks, Richard Lee, 4,014,199.
Kelsey, Paul V., Jr.; and Mathers, James E., 4,014,812.
Shaffer, John W., 4,014,638.

Gude, Fritz; Brandt, Siegfried; Wolf, Elmar; and Obendorf, Johann, to Veba-Chemie AG. Method for preparing moldings and coatings. 4,014,954, Cl. 260-830.00P.

Guidry, Shelby L.: *See*—
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Gultex, Incorporated: *See*—
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Gunther, W. H. H.: *See*—
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Gursky, Pavel Ivanovich: *See*—
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Guseinov, Chingiz Saibovich: *See*—
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Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., to HCH. Bertrams Aktiengesellschaft; and Bayer Aktiengesellschaft. Concentration and separation of corrosive liquid mixtures. 4,014,735, Cl. 159-13.00A.

Guthrie, Dale H.: *See*—
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Gutierrez, Moises Hernandez. Decompression beds for childbirth and method for using them. 4,014,344, Cl. 128-361.000.

H. Berthold A.G.: *See*—
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Haarmann & Reimer GmbH: *See*—
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Haas, Friedrich; Nutzel, Karl; and Jahn, Hans-Joachim, to Bayer Aktiengesellschaft. Non-hardening high molecular weight transpolypentenamers. 4,014,848, Cl. 260-33.6AQ.

Hacha, Thomas H.: *See*—
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Hachiya, Takeo: *See*—
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Hadley, John R.; LeBrun, Michel A., Jr.; McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., to Republic Tool & Manufacturing Corporation. Safety cap. 4,014,449, Cl. 215-215.000.

Haemer, Laurence F., to Congoleum Corporation. Bonded carpeting. 4,015,036, Cl. 428-88.000.

Haemmerle, A.G.: *See*—
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Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, to Japan Metals and Chemicals Co., Ltd. Method of and an apparatus for measuring the electrode length in an electric furnace. 4,014,102, Cl. 33-126.600.

Hagino, Minoru: *See*—
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Hahn, Gunther: *See*—
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Hahnkamm, Volker: *See*—
Woditsch, Peter; Hund, Franz; Buxbaum, Gunter; Hahnkamm, Volker; and Pflugmacher, Ingo, 4,014,710.

Hain, Larry A., to Dentsply Research & Development Corporation. Headrest for operatory chair. 4,014,594, Cl. 297-408.000.

Halasa, Adel Farhan: *See*—
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Haleen, Leonard W.; and Pearson, Alan, to Aluminum Company of America. Precipitation of aluminum oxide having low sodium oxide content. 4,014,985, Cl. 423-629.000.

Hall, John B.; and Wiegers, Wilhelmus Johannen, to International Flavors & Fragrances Inc. Process and product produced by said process. 4,014,944, Cl. 260-631.500.

Hall, Mitchell A., to Monarch Tool & Manufacturing Company. Device for testing the flatness, size and shape of coin-tokens. 4,014,424, Cl. 194-102.000.

Halleck, Michael E.; and Thomson, Thomas H., to Staodynamics, Inc. Transcutaneous nerve stimulator device and method. 4,014,347, Cl. 128-422.000.

Haller, Jacob S.: *See*—
Cover, William S.; and Haller, Jacob S., 4,014,087.

Ham, William Edward, to RCA Corporation. Edgeless transistor. 4,015,279, Cl. 357-23.000.

Hamada, Osamu, to Sony Corporation. Pulse width modulated signal amplifier. 4,015,213, Cl. 330-10.000.

Hamamatsu Terebi Kabushiki Kaisha: *See*—
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Hamilton, William L. Temperature control apparatus. 4,014,499, Cl. 236-46.00R.

Hammann, Ingeborg: *See*—
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Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,014,998.
Hammer, Walter; and Martin, Jean-Claude, to Centre Electronique Horloger S.A. Frequency generator compensated as a function of at least one physical parameter of the environment. 4,015,208, Cl. 328-39.000.
Hamner, Glen P., to Exxon Research and Engineering Company. Heavy crude conversion catalyst. 4,014,821, Cl. 252-470.000.
Hamprecht, Gerhard, to BASF Aktiengesellschaft. Production of β-haloalkylaminosulfonyl halides. 4,014,931, Cl. 260-543.00R.
Hand, John James: *See—*
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Hanni, Eduard Alexander; and Zbornik, Vaclav Fraubisik, to Haemmerle, A.G. Machine for processing metal in sheet or plate form. 4,014,204, Cl. 72-465.000.
Hanning, Robert. Method for injection molding a composite foamed body having a foamed core and a continuous surface layer. 4,014,966, Cl. 264-45.100.
Hanson, D. Wayne: *See—*
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Happel, Robert, to Daimler-Benz Aktiengesellschaft. Externally ignited internal combustion engine with ignition chamber. 4,014,301, Cl. 123-32.0SP.
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor photoelectron emission device. 4,015,284, Cl. 357-16.000.
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Harbison, William H.; and Plisky, John J., to Anderson Company, The. Locking lever for plastic link. 4,014,066, Cl. 15-250.420.
Hardies, Alfons Eugeen Maria, to U.S. Philips Corporation. Electric lamp with molybdenum contact pins surrounded by non-corrosive metal sleeves. 4,015,165, Cl. 313-318.000.
Hardison, Leslie C., to Air Revources, Inc. Removal of hydrogen sulfide from gases. 4,014,983, Cl. 423-575.000.
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Harima, Eiichi; and Okubo, Yosiro. Method for producing individually wrapped foodstuff slices. 4,015,021, Cl. 426-393.000.
Harrington, Richard P.; and Harrington, Russell J. Combination lock. 4,014,191, Cl. 70-25.000.
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Hart, David R.; and Cunningham, Wade K., to United States Pipe and Foundry Company. Substrate reinforced rubber structure and compound for forming same. 4,014,827, Cl. 260-3.000.
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Hartman, Susan Nilson. Mechanical push button lock. 4,014,194, Cl. 70-313.000.
Harvill, William Andrew, to Coca-Cola Co., The. Automatic change-over device for liquid dispensing system. 4,014,461, Cl. 222-94.000.
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Hayati, Hossein; and Towers, Russell S., to Stauffer Chemical Company. One package coating composition. 4,014,703, Cl. 106-1.000.
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Hechler, Valentine, IV. Water and concentrate supply valves for proportioning mixer-dispenser. 4,014,363, Cl. 137-218.000.
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Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,014,916.
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Keith, Dennis; and Weigele, Manfred, 4,014,898.
Hogan, John P.; Nasser, Benny E.; and Delap, Joseph A., to Phillips Petroleum Company. Silane adjuvant for chromium oxide catalyst. 4,014,816, Cl. 252-430.000.
Hogg, Theodore B.: *See*—
Cline, Lawrence R.; and Hogg, Theodore B., 4,014,400.
Hogland, Gerald Hugh: *See*—
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Holcomb, Richard H.: *See*—
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Holt, Brian: *See*—
Randell, Donald Richard; Holt, Brian; and Virgin, Alan Geoffrey, 4,014,887.
Holt, William David, to Lucas Electrical Company Limited. Electrical systems for road vehicles. 4,015,136, Cl. 307-10.00R.
Homeyer, Bernhard: *See*—
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Hooker Chemicals & Plastics Corporation: *See*—
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Payne, Rex E.; and Aegerter, Henry F., Jr., 4,014,068.
Hope, Henry F.; and Hope, Stephen F. Feeding apparatus for X-ray film and the like. 4,014,536, Cl. 271-162.000.
Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,014,536.
Hopkins, Albert L., Jr.; and Smith, Thomas Basil, III, to Charles Stark Draper Laboratory, Inc., The. Synchronous fault tolerant multiprocessor system. 4,015,246, Cl. 340-172.500.
Hori, Toshihiko: *See*—
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Horizons Incorporated, a division of Horizons Research Incorporated: *See*—
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Horman, Ian; and Cazenave, Paul, to Societe d'Assistance Technique pour Produits Nestle S.A. Aromatizing tea with geranyl acetone and δ-decalactone. 4,015,024, Cl. 426-536.000.
Horn, J. Drew: *See*—
Romanski, Eric R.; Horn, J. Drew; and Dutt, William H., 4,015,038.
Horn, Klaus: *See*—
Moraw, Roland; Schadlich, Gunther; and Horn, Klaus, 4,014,603.
Horn, Peter; and von Rumohr, Cai, to BASF Aktiengesellschaft. Self-extinguishing reinforced polycarbonate molding compositions. 4,014,849, Cl. 260-37.0PC.
Horton, Eugene B., Jr.: *See*—
Barnes, Vernon M., Jr.; Flournoy, Norman E.; and Horton, Eugene B., Jr., 4,015,270.
Horvath, Tibor. Barrel for ball throwing machine. 4,014,307, Cl. 124-81.000.
Hosaki, Yoshihiko: *See*—
Furuya, Osamu; Wada, Koichi; Hosaki, Yoshihiko; and Mihara, Nobutake, 4,014,928.
Hoshino, Masayuki, to Iwatani & Co., Ltd. Powder molding press. 4,014,634, Cl. 425-78.000.
Hough Manufacturing Corporation: *See*—
Williams, Charles E., 4,014,137.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Alkanoyl substituted benzoic acids and esters. 4,015,010, Cl. 424-308.000.
Houston, George F., to Briggs & Stratton Corporation. Device to reduce the nitrogen oxide content in the exhaust gas of an internal combustion engine. 4,014,302, Cl. 123-119.00A.
Hovens, Paulus Joseph Maria, to U.S. Philips Corporation. Color television receiver including a chrominance subcarrier regenerator. 4,015,287, Cl. 358-17.000.
Hovorak, William P. Cattle oiler. 4,014,294, Cl. 119-157.000.
Howe, Charles W.: *See*—
Emery, Vernon V.; Howe, Charles W.; and Marcella, Joseph, 4,014,640.
Howell, Ronald Lee, to J. M. Huber Corporation. Apparatus for producing carbon black. 4,014,654, Cl. 23-259.500.
Howmedica, Inc.: *See*—
Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., 4,014,690.
Hoyer, Wilmer A.; and Spann, Michael M., to Exxon Production Research Company. Method of determining hydrocarbon saturation in shaly formations by measuring dielectric constant in first and second portions of the formations. 4,015,195, Cl. 324-1.000.
Hozumi, Keiichi: *See*—
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Hrdlicka, Theodore Frederick. Combination fishing pole holder and tackle box. 4,014,128, Cl. 43-21.200.
Hu, Hung Liang; and Rosier, Laurence Lee, to International Business Machines Corporation. Transfer of domains between fields. 4,015,249, Cl. 340-174.0TF.

Hucek, Richard F.: *See—*
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Hudson, Frederick W., to Xerox Corporation. Magnetic developer removal system. 4,014,065, Cl. 15-306.00R.

Hughes, John Lawrence; and Liu, Robert Chung-Huan, to Armour Pharmaceutical Company. Substituted 4'-hydroxyphenyl guanidines and methods of using the same. 4,014,934, Cl. 260-565.000.

Hughes, Robert L. Traffic barricade dolley. 4,014,560, Cl. 280-47.13R.

Hughes Tool Company: *See—*
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Hund, Franz: *See—*
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Hunter, H. Eric: *See—*
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Huntley, Christopher Ryland, to GTE Lenkurt (Canada) Ltd. Protective relaying modem receiver. 4,015,206, Cl. 325-435.000.

Huppi, Gerhard; De Silva, Wijitha; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. 1-(3,7-Dimethyloctyl)-1(2-propenyl)-and 1(2-propynyl)-piperidinium bromides as plant growth regulants. 4,014,678, Cl. 71-94.000.

Husse, Massimo; and Lagonigro, Mauro, to Fiat Societa per Azioni. Device for use in the ultrasonic measurement of mass flow of gas. 4,014,210, Cl. 73-194.00A.

Hussey Manufacturing Company, Inc.: *See—*
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Huston, John Timothy: *See—*
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Hutzezon, Frits, to Akzona Incorporated. Method and apparatus for cutting tow. 4,014,231, Cl. 83-100.000.

Hwang, Kwang-Chou: *See—*
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Hydro Tech International, Inc.: *See—*
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Kelly, James A.; Ames, Thomas J.; Lochte, Glen E.; and Bowen, Burlie R., 4,014,180.

Hyun, Terry C. Kite reel. 4,014,477, Cl. 242-96.000.

Iacobelli, Michael D. Ornamental device. 4,015,163, Cl. 312-223.000.

Ibbotson, Arthur, to Imperial Chemical Industries Limited. Carbodiimides. 4,014,935, Cl. 260-566.00R.

Ichioka, Hisakazu: *See—*
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Ikeda, Kiyoshi; and Mitani, Toshihiko, to Nippon Electric Company, Ltd. Baseband signal switching arrangement for diversity reception in a PCM radio communication system. 4,015,205, Cl. 325-304.000.

Ikeda, Ryo; Hori, Toshihiko; and Nakamura, Susumu, to Yokohama Rubber Co., Ltd., The. Tire with embedded current collector. 4,014,418, Cl. 191-45.00R.

Iles, Thomas L.; Hwang, Kwang-Chou; and Kinsell, Robert C., to Garrett Corporation, The. Air conditioning system for aircraft. 4,014,179, Cl. 62-88.000.

Ilford Limited: *See—*
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Illk, Donald J.: *See—*
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Imperial Chemical Industries Limited: *See—*
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Carter, Graham; and Hinton, Anthony John, 4,014,676.
Clachan, Margaret Loudon; Kennedy, David Rankine; Shephard, Basil Robert, deceased; and Shephard, Doreen, executrix, 4,014,701.
Cooper, Richard Roy; and Whiteley, Kenneth Stephenson, 4,014,859.
Crosby, John; Rennie, Robert Allan Campbell; Tanner, John; and Paton, Robert Michael, 4,014,893.
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Imperial Metal Industries (Kynoch) Limited: *See—*
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Indiana University Foundation: *See—*
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Industrial Electronic Hardware Corporation: *See—*
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Industrie Pirelli S.p.A.: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
Mercurio, Luigi; and Ravasio, Piercarlo, 4,015,245.

Ingersoll, Elmer Wayne, to Brown, Glenn L. Gasoline vaporizer apparatus. 4,014,306, Cl. 123-141.000.

Innovisions Enterprises, Inc.: *See—*
Arad, Avi, 4,014,543.

Inoue, Hisao: *See—*
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Inoue, Shigeki: *See—*
Yoshida, Akitoshi; Yanagida, Koichiro; Inoue, Shigeki; Maruyama, Tadanobu; and Nakamura, Reiko, 4,015,040.

Inoue, Yoshikatsu; and Takeuchi, Takeshi, to Hochiki Corporation. Voluntary information transmitting apparatus in a wired television system. 4,015,074, Cl. 358-86.000.

Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf: *See—*
Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, 4,015,242.
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Intellectual Property Development Corporation: *See—*
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International Business Machines Corporation: *See—*
Davidson, Evan E.; and Lane, Ralph D., 4,015,147.
Druschel, William O.; Gardineer, Bayard G., Jr.; Manning, Stanley A.; and Musits, Bela, 4,014,576.
Hu, Hung Liang; and Rosier, Laurence Lee, 4,015,249.
Riddle, Stanley T.; and Vair, Gary G., 4,014,141.
Stevenson, Peter Alan; and Vogel, Stephen Martin, 4,015,291.
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International Flavors & Fragrances Inc.: *See—*
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Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 4,014,823.
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,014,351.
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International Harvester Company: *See—*
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International Paper Company: *See—*
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International Standard Electric Corporation: *See—*
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Lomax, Ronald W., 4,015,225.

International Telephone and Telegraph Corporation: *See—*
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Miller, Dale Lloyd, 4,015,171.

in't Veld, Cornelis, to National Marine Service, Inc. Oil boom for collecting and skimming oil on a water surface. 4,014,795, Cl. 210-242.00R.

Inventronics, Inc.: *See—*
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Irvin Industries, Inc.: *See—*
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Ishibashi, Kazushige: *See—*
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Ishibashi, Toshihiro; and Naito, Satoshi, to Yazaki Sogyo Kabushiki Kaisha. Absorption refrigerator of natural circulation type. 4,014,183, Cl. 62-476.000.

Ishibashi, Wataru; Taira, Shigenobu; and Migita, Ken, to Showa Denko Kabushiki Kaisha. Automatic analytic apparatus of liquids. 4,014,652, Cl. 23-253.00R.

Ishida, Mikio: *See—*
Eda, Kazuo; Tanaka, Masanobu; Kajita, Harumasa; Ishida, Mikio; and Matsuoka, Michio, 4,015,228.

Ishida, Yasuto: *See—*
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Ishihara Sangyo Kaisha Ltd.: *See—*
Adachi, Masaaki; Shirai, Takayoshi; and Nakasuzi, Norio, 4,014,976.

Ishii, Shinichiro; Kakao, Kanji; Ueno, Takafumi; and Kimura, Jun, to Matsushita Electric Industrial Co., Ltd. Linear phase response multiway speaker system. 4,015,089, Cl. 179-1.00E.

Ishiodori, Makoto, to Sony Corporation. Noise eliminating circuit for video television signal. 4,015,076, Cl. 358-167.000.

Isono, Masao: *See—*
Kakinuma, Atsushi; Sugino, Hiromu; Moriya, Norihiko; and Isono, Masao, 4,014,860.

ISPOW AG: *See—*
Funke, Peter, 4,014,559.

Itaya, Nobushige: *See—*
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Itek Corporation: *See—*
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Ithaca Gun Company, Inc.: *See—*
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Ito, Tadashi: *See—*
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Itoda, Masaru: *See—*
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Itoh, Masumi, to Fujisawa Pharmaceutical Co., Ltd. Oxime carbonates. 4,014,915, Cl. 260-463.000.

ITT Industries, Inc.: *See—*
Pickel, Hajo, 4,014,415.

Iura, Yukio: *See—*
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; Uchidoi, Masanori; Ito, Tadashi; and Iura, Yukio, 4,015,198.

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Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Iwasaki, Kazuhito: *See*—
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Iwasaki, Yukio: *See*—
Oda, Tatsuharu; Iwasaki, Yukio; Koyamd, Hideo; Maruyama, Shigeo; Matsubara, Takashi; Hozumi, Keiichi; and Kano, Hiroya, 4,014,495.

Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; Uchidoi, Masanori; Ito, Tadashi; and Iura, Yukio, to Canon Kabushiki Kaisha. Shutter-time-preference single lens reflex camera with automatic film wind-up. 4,015,198, Cl. 354-29.000.

Iwatani & Co., Ltd.: *See*—
Hoshino, Masayuki, 4,014,634.

Iwawaki, Shiho: *See*—
Watanabe, Noritoshi; Fujita, Seigoro; Shibata, Kazuo; Iwawaki, Shiho; and Takeda, Hiromu, 4,015,043.

Izawa, Tsuyoshi; and Itoda, Masaru, to Glory Kogyo Kabushiki Kaisha. Coin wrapping method. 4,014,155, Cl. 53-32.000.

J. I. Case Company: *See*—
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J. M. Huber Corporation: *See*—
Howell, Ronald Lee, 4,014,654.

J. M. Voith GmbH: *See*—
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Jacks, Kenneth R. Span trolley. 4,014,516, Cl. 254-134.500.

Jackson, Edgar D., to Steel Web Corporation. Saw horse. 4,014,404, Cl. 182-155.000.

Jacobs, Eli S.: *See*—
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Jacobus, Clarence E.: *See*—
Nelson, Neal A.; and Jacobus, Clarence E., 4,014,486.

Jacottet, Jean Louis. Hydrostatic sealing device. 4,014,555, Cl. 277-3.000.

Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. N-cinnamylcarbamic acid esters. 4,014,920, Cl. 260-471.00C.

Jaffe, Wolfgang: *See*—
Herr, John Addison; and Jaffe, Wolfgang, 4,014,275.

Jahn, Hans-Joachim: *See*—
Haas, Friedrich; Nutzel, Karl; and Jahn, Hans-Joachim, 4,014,848.

Jahnle, Herbert A., to Budd Company, The. Solid state forming of thermoplastic material. 4,014,970, Cl. 264-161.000.

Jakel Company, Inc.: *See*—
Jakel, Paul A., 4,014,444.

Jakel, Paul A., to Jakel Company, Inc. Snowmobile trailer. 4,014,444, Cl. 214-85.000.

Jamieson, Patrick J., to Rothmans of Pall Mall Canada Limited. Apparatus for automatically controlling the initiation and/or termination of functions of apparatus or processes using a clock pulse generator. 4,014,352, Cl. 131-21.00R.

Janson, Richard W. Curtain suspension assembly. 4,014,071, Cl. 16-93.00R.

Jansson, Staffan, to Aktiebolaget Svenska Flaktfabriken. Gas filter tube locking apparatus. 4,014,672, Cl. 55-357.000.

Japan Metals and Chemicals Co., Ltd.: *See*—
Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, 4,014,102.

Jarlan, Gerard Eugene, to Canadian Patents and Development Limited. Marine pier having deeply submerged storage container. 4,014,177, Cl. 61-87.000.

Jean Waltersheid GmbH: *See*—
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Jerabek, Alois: *See*—
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Jerguson Gaga and Valve Company: *See*—
Pontefract, Robert A., 4,014,214.

Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Drive for multicolor sheet-fed rotary printing presses with tandem-mounted printing units. 4,014,259, Cl. 101-183.000.

Jinnai, Toshio: *See*—
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Johns-Manville Corporation: *See*—
Bell, George Richard; and Lamar, Richard Seyb, 4,014,788.
Miller, William Clyde, 4,014,704.
Wells, David Lee; and Raab, Ronald Buxton, 4,014,150.

Johnson, Allan S., to Tapmatic Corporation. Clutching means adapted for use in tapping attachments. 4,014,421, Cl. 192-48.910.

Johnson, Bruce C.; Sinha, Rabindra Kumar; and Urbanic, John Emery, to Calgon Corporation. Manufacture of activated carbon from sized coal. 4,014,817, Cl. 252-445.000.

Johnson, Clifford R.: *See*—
Troutner, Arthur L.; Johnson, Clifford R.; and Willmorth, Stanley J., 4,014,201.

Johnson, Francis; Paul, Kenneth G.; and Favara, Duccio, to Dow Chemical Company, The. Process for preparing methyl jasmonate and related compounds. 4,014,919, Cl. 260-468.00K.

Johnson & Johnson: *See*—
Cheslow, Ernest, 4,014,340.
Tritsch, Ludwig, 4,014,339.

Johnson, Joseph L.; and Guidry, Shelby L., to Schlumberger Technology Corporation. Subsurface safety valve apparatus. 4,014,386, Cl. 166-321.000.

Johnson, Ray W.; and Gordon, David L., to Gordon, David L. Gauge. 4,014,621, Cl. 408-16.000.

Johnson, William James: *See*—
Golz, Reinhard Heinz; and Johnson, William James, 4,014,632.

Johrde, Paul S., to Westinghouse Electric Corporation. Dynamoelectric machine locking wedge for coil retention. 4,015,156, Cl. 310-214.000.

Joiles, Pierre; and Migliore-Samour, Daniele, to Agence Nationale de Valorisation de la Recherche (ANVAR). Acetylated watersoluble extracts of corynebacteria, process for obtaining them and their use. 4,014,992, Cl. 424-92.000.

Jolley, Paul E.; and Wooten, Harvey M., to Singer Company, The. Needle bars for tufting machines. 4,014,278, Cl. 112-226.000.

Jones, Alan P., to Brandt-Pra, Inc. Electronic control means for paper counting and handling machines. 4,015,110, Cl. 235-925.00B.

Jones, Basil B. Off-set flange for mounting a water closet, and method of using same. 4,014,053, Cl. 4-252.00R.

Jones, Derek Arthur; and Cox, Robert William, to British Gas Corporation. Systems for heating fluids. 4,014,316, Cl. 126-360.00R.

Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, to Foseco International Limited. Manufacture of steel. 4,014,684, Cl. 75-51.000.

Jones, Evan Thomas Richard; and Fishburn, Robert Anthony, to Foseco International Limited. Manufacture of steel. 4,014,685, Cl. 75-51.000.

Jones, John Paul, to Air Products and Chemicals, Inc. Normally on led coulometric timing system. 4,015,150, Cl. 307-311.000.

Jones, Thomas. Differential air pressure driven engine. 4,014,172, Cl. 60-650.000.

Jones, Ulpian Robin Edward Frost, to Metal Box Company Limited, The. Composite containers. 4,014,723, Cl. 156-69.000.

Jordan, Ulice A.; and Quinn, Governor V., to Three Line Research & Development Co., Inc. Spike cluster. 4,014,114, Cl. 36-67.00D.

Joschek, Hans-Ingo: *See*—
Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, 4,014,914.

Jouveinal S.A.: *See*—
Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel Gerard, 4,014,909.

Joyce, Donald James, to Consort Project Development Limited. Apparatus for feeding and applying features to continuous webs or items thereon. 4,014,490, Cl. 226-76.000.

Juliano, Angelo L.; and Miller, Aaron, to Quaker Oats Company, The. Cosmetics containing finely divided oat flour. 4,014,995, Cl. 424-168.000.

Junkersdorf, Willi: *See*—
Gref, Hans; Schweicher, Wolfgang; Frenken, Hans; Bussmann, Heinz; Voss, Karl; Schaffer, Helmut; and Junkersdorf, Willi, 4,014,491.

Jurowski, Willi; Kohler, Alfred; Prohaska, Hans; and Schrade, Eugen, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Vehicle wiper blade construction. 4,014,061, Cl. 15-250.420.

Kabas, Guglielmo: *See*—
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,014,871.

Kabushiki Kaisha Daini Seikosha: *See*—
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Kabushiki Kaisha Suwa Seikosha: *See*—
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Kabushikikaisha Ochiai Seisakusho: *See*—
Kazama, Hachiro, 4,014,596.

Kadin, Saul B.; and Moore, Peter F., to Pfizer Inc. 1-Oxo-1H-6-piperidinopyrimido[1,2-a]quinoline-2-carboxylic acids and esters. 4,014,881, Cl. 260-256.40Q.

Kadota, Shozo: *See*—
Fujimoto, Yoshiji; and Kadota, Shozo, 4,015,239.

Kadowaki, Koju, to Mitsubishi Petrochemical Company Limited. Process for production of unsaturated acids from corresponding unsaturated aldehydes. 4,014,927, Cl. 260-530.00N.

Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co.: *See*—
Emich, Peter A. W., deceased; Emich nee Leirmann, Edith G. H.; Emich, Peter-Michael; Emich, Ulrich; and Emich, Barbara, heirs, 4,015,022.

Kahler, Richard W. Fluid-cooled smoking device. 4,014,353, Cl. 131-173.000.

Kaido, Tsutomu; Asahi, Seiichi; and Nishikawa, Sinjiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing knitted long-pile fabrics and fabrics made by the method. 4,014,185, Cl. 66-84.00R.

Kaiser, Bernd-Ulrich; Dhein, Rolf; Kuchenmeister, Rolf; and Fischler, Hans-Michael, to Bayer Aktiengesellschaft. Liquid stoving-lacquer systems based on oil-free polyesters. 4,014,708, Cl. 106-287.00R.

Kaiser, Hans-Joachim: *See*—
Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., 4,014,735.

Kaiser, Joachim: *See*—
Kunstmann, Rudolf; and Kaiser, Joachim, 4,014,884.

Kajikawa, Masahiro: *See*—
Sawada, Koshichi; Kajikawa, Masahiro; and Kotani, Koichi, 4,015,019.

Kajima Corporation: *See*—
Sato, Kuniaki; Toyama, Kozo; MAtsushita, Eiji; Tomita, Akio; and Suzuki, Shuei, 4,014,089.

Kajita, Harumasa: *See*—
Eda, Kazuo; Tanaka, Masanobu; Kajita, Harumasa; Ishida, Mikio; and Matsuoka, Michio, 4,015,228.

Kakao, Kanji: *See*—
Ishii, Shinichiro; Kakao, Kanji; Ueno, Takafumi; and Kimura, Jun, 4,015,089.

Kaki, Koji: *See*—
Tomiya, Ryuichi; Kaki, Koji; and Tezuka, Yoshitomo, 4,014,561.

Kakinuma, Atsushi; Sugino, Hiromu; Moriya, Norihiko; and Isono, Masao, to Takeda Chemical Industries, Ltd. Plasminostreptin (enzyme inhibitor) and method for producing it from streptomyces. 4,014,860, Cl. 260-112.00R.

Kalart Victor Corporation: *See*—
Schwartz, Morris, 4,014,604.

Kallrath, Gottfried: *See*—
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 4,015,031.

Kamath, Venkatesh: *See*—
Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 4,014,823.

Kamensky, Vyacheslav Tikhonovich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.

Kameny, Stanley L. Electrode. 4,014,345, Cl. 128-417.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kaido, Tsutomu; Asahi, Seiichi; and Nishikawa, Sinjiro, 4,014,185.
Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,014,842.
Suzuki, Kazuo; Nanao, Tsutomu; and Miyazaki, Hiroshi, 4,014,770.

Kanner, Bernard, to Union Carbide Corporation. Tertiary alcohol-bearing organosilicone polymers. 4,014,825, Cl. 260-2.5AH.

Kano, Hiroya: *See*—
Oda, Tatsuharu; Iwasaki, Yukio; Koyamd, Hideo; Maruyama, Shigeo; Matsubara, Takashi; Hozumi, Keiichi; and Kano, Hiroya, 4,014,495.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Watanabe, Noritoshi; Fujita, Seigoro; Shibata, Kazuo; Iwawaki, Shiho; and Takeda, Hiromu, 4,015,043.

Karady, Sandor: *See*—
Christensen, Burton G.; Cama, Lovji D.; Sletzinger, Meyer; and Karady, Sandor, 4,014,873.

Karakawa, Fumio: *See*—
Tanaka, Sadao; Endo, Kiyosi; and Karakawa, Fumio, 4,015,154.

Karamarkovich, John, to Raymond Lee Organization, Inc., The, a part interest. Pliers with modified jaws for use in auto body repair. 4,014,226, Cl. 81-426.000.

Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article and method. 4,014,341, Cl. 128-287.000.

Karayannis, Nicholas M.; Turner, James A.; and Lee, Sam S., to Standard Oil Company (Indiana). Catalyst and process for the polymerization of olefins. 4,015,060, Cl. 526-141.000.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 4,014,760, Cl. 204-52.00R.

Karlen, Urs; and Morawietz, Hans, to Ciba-Geigy Corporation. Process for the manufacture of anthraquinone compounds. 4,014,906, Cl. 260-373.000.

Karol, Fredrick John, to Union Carbide Corporation. Fused ring catalyst and ethylene polymerization process therewith. 4,015,059, Cl. 526-130.000.

Karube, Yukuo; Suzuki, Koji; and Ezaki, Ryoichi, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. DC motor. 4,015,181, Cl. 318-325.000.

Kassai, Noriaki: *See*—
Tanaka, Kazuaki; Ishida, Yasuto; Yanagi, Kimiyoshi; Kassai, Noriaki; and Tanaka, Toshiyuki, 4,014,941.

Kasubuchi, Takeshi; Ozawa, Kaoru; and Makita, Tomoo, to Sharp Kabushiki Kaisha. Ink jet printer having air resistance distortion control. 4,015,267, Cl. 346-1.000.

Kasuya, Masamitsu: *See*—
Akiyama, Mitsuo; and Kasuya, Masamitsu, 4,014,538.

Kaufman, Barry M., to R F L Industries, Inc. Frequency shift keyed toned generator. 4,015,220, Cl. 331-179.000.

Kaugars, Girts, to Upjohn Company, The. Alkylthio benzoic acid phenyl-hydrazides. 4,014,932, Cl. 260-558.00H.

Kawagoe, Hiroto; and Nomiya, Kosei, to Hitachi, Ltd. Electronic circuit using field effect transistor with compensation means. 4,015,219, Cl. 331-111.000.

Kawahara, Takashi: *See*—
Fujimaki, Hiroto; Hayashi, Haruhisa; and Kawahara, Takashi, 4,014,980.

Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, to Pilot Man-Nen-Hitsu Kabushiki Kaisha; and Toyo Giken Kogyo Kabushiki Kaisha. Continuous electrolytical treatment of aluminum or its alloys. 4,014,758, Cl. 204-28.000.

Kawarada, Hiroshi: *See*—
Ohshima, Nobumasa; Kawarada, Hiroshi; Noma, Shinichi; and Tatsumichi, Toshio, 4,015,166.

Kazama, Hachiro, to Kabushikikaisha Ochiai Seisakusho. Self-centerable bearing. 4,014,596, Cl. 308-72.000.

Keagle, Walter S. Variable height stand. 4,014,517, Cl. 254-45.000.

Keeling, Walter William. System for increasing the effective head of a dam without physically increasing the height of the dam. 4,014,173, Cl. 61-19.000.

Keim, Roy L. Ring toss game. 4,014,545, Cl. 273-95.00H.

Keiser, David H., Jr. Hedge shears. 4,014,093, Cl. 30-248.000.

Keith, Billy M.: *See*—
Cannon, Sidney E.; Keith, Billy M.; Cannon, Charles E.; and Caldwell, Joseph H., 4,014,451.

Keith, Dennis; and Weigele, Manfred, to Hoffmann-La Roche Inc. N,N-dialkylaminoethoxyethylphthalimidomalonates. 4,014,898, Cl. 260-326.00N.

Kelley Company, Inc.: *See*—
Artzberger, Thomas G.; and Wiener, Thomas J., 4,014,059.

Kells, John D. Refrigerator temperature controls. 4,014,178, Cl. 62-3.000.

Kelly, James A.; Ames, Thomas J.; Lochte, Glen E.; and Bowen, Burlie R., to Hydro Tech International, Inc. Method for making a remote controlled sub-sea pipe connection. 4,014,180, Cl. 61-110.000.

Kelsey, Paul V., Jr.; and Mathers, James E., to GTE Sylvania Incorporated. Method of preparing rare earth pyrohafnate phosphors. 4,014,812, Cl. 252-301.40F.

Kendall Company, The: *See*—
Rappleyea, Frederick A., 4,014,048.
Shah, Nayan S., 4,014,322.

Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., to Texas Instruments Incorporated. Discrete, fixed-value capacitor. 4,015,175, Cl. 361-313.000.

Kenics Corporation: *See*—
Hermann, Paul F., 4,014,463.

Kennedy, David Rankine: *See*—
Clachan, Margaret Loudon; Kennedy, David Rankine; Shephard, Basil Robert, deceased; and Shephard, Doreen, executrix, 4,014,701.

Kenyon, Charles L. Cartridge for a bacteria screening device for continuously monitoring and recording the existence of air borne bacteria and other microorganisms. 4,014,747, Cl. 195-127.000.

Keyt, Ferris Gene: *See*—
Kleid, Robert E.; Illk, Donald J.; and Keyt, Ferris Gene, 4,014,535.

Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Process for the purification of liquid sorbents comprising bimetallic salt complexes. 4,014,950, Cl. 260-677.00A.

Khrenov, Konstantin Konstantinovich: *See*—
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Kiesow, Lutz A., to Baxter Travenol Laboratories, Inc. Method and apparatus for delivering blood oxygen association curve information. 4,014,649, Cl. 23-230.00B.

Kikkawa, Takahiro: *See*—
Hirata, Toshinori; and Kikkawa, Takahiro, 4,014,445.

Kikuchi, Masaru: *See*—
Yoshino, Susumu; Kikuchi, Masaru; and Ichioka, Hisakazu, 4,014,509.

Kimura, Jun: *See*—
Ishii, Shinichiro; Kakao, Kanji; Ueno, Takafumi; and Kimura, Jun, 4,015,089.

Kimura, Seiji: *See*—
Tanaka, Shinichi; Sano, Kenji; and Kimura, Seiji, 4,015,107.

Kimura, Shigeo: *See*—
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, 4,014,802.

Kimura, Torazo. Electrified amusement device. 4,014,544, Cl. 273-85.00R.

Kimura, Yoshiyuki: *See*—
Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, 4,014,102.

King, Paul Anstee Frank. Knock-down construction. 4,014,270, Cl. 108-111.000.

Kinjo, Hisao; Akuwa, Fumio; and Haneji, Yasuo, to Victor Company of Japan, Limited. Video disc recording and/or reproducing apparatus with a single transducer head. 4,015,289, Cl. 360-11.000.

Kinnaird, Laird D.; and Moorhead, Seth B., Jr., to Martin Marietta Corporation. Gas cooling system for hypersonic vehicle nosetip. 4,014,485, Cl. 244-117.00A.

Kinnison, Daniel E. Air precleaner. 4,014,673, Cl. 55-396.000.

Kinsell, Robert C.: *See*—
Iles, Thomas L.; Hwang, Kwang-Chou; and Kinsell, Robert C., 4,014,179.

Kintish, Irving L., to United States of America, Army. Vehicle incapacitator. 4,014,265, Cl. 102-70.00S.

Kippenberg, Horst: *See*—
Hassler, Heinrich; and Kippenberg, Horst, 4,014,659.

Kircher, Morton S.; and Engler, Maynard F., to Olin Corporation. Diaphragm cell having uniform and minimum spacing between the anodes and cathodes. 4,014,775, Cl. 204-252.000.

Kirillov, Ivan Ivanovich; Agishev, Alexandr Petrovich; Ameljushkin, Vladimir Nikolaevich; Bogdanovich, Sabir Yakubovich; Guseinov, Chingiz Saibovich; Medvedev, Valentin Valentinovich; Faddeev, Igor Petrovich; and Rozin, Viktor Sergeevich. Turboexpander. 4,014,674, Cl. 62-38.000.

Kirn, Thomas G., to Eastman Kodak Company. Rotatable multifaceted tape guide for use in a cassette. 4,015,292, Cl. 360-130.000.

Kirsch, Gunther; Cherdron, Harald; and Herwig, Walter, to Hoechst Aktiengesellschaft. Thermoplastic polyamide moulding compositions. 4,014,957, Cl. 260-857.0PG.

Kitada, Takaharu, to Sony Corporation. Recording and/or reproducing apparatus. 4,015,090, Cl. 179-6.00R.

Kitamoto, Tatsuji: *See—*
Sasazawa, Koji; Yamada, Yasuyuki; Kitamoto, Tatsuji; and Akashi, Goro, 4,015,030.

Kitterman, Roger L. Thermal engine. 4,014,170, Cl. 60-529.000.

Kiwaki, Hisakatsu: *See—*
Sasaki, Akio; Kuwabara, Kiyoteru; and Kiwaki, Hisakatsu, 4,015,187.

Klahn, Uwe; and Oberwelland, Klaus, to August Storck KG. Method of producing individually wrapped confections and apparatus for performing the same. 4,014,156, Cl. 53-34.000.

Klaiber, Erich Manfred: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,014,351.

Klauer, Hans-Dieter, to Braun Aktiengesellschaft. Piezoelectric igniter with a striking mechanism. 4,015,151, Cl. 310-8.700.

Kleber, Rolf, to Hoechst Aktiengesellschaft. Fiber-lubricating compositions. 4,014,800, Cl. 252-8.800.

Kleid, Robert E.; Illk, Donald J.; and Keyt, Ferris Gene, to Pitney-Bowes, Inc. Continuous sheet collating method and apparatus. 4,014,535, Cl. 270-19.000.

Klein, Gunter Peter: *See—*
Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, 4,014,752.

Klein, Herschel A.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Air pollution control system and method. 4,014,978, Cl. 423-242.000.

Kleine-Weischede, Klaus: *See—*
Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., 4,014,735.

Kleiner, Eduard Karl: *See—*
Dear, Robert Ernest Arthur; and Kleiner, Eduard Karl, 4,014,926.

Klemt, Gerhard: *See—*
Pieverling, Klaus V.; Klemt, Gerhard; Maier, Bruno; and Leypold, Dieter, 4,015,251.

Klimenko, Gennady Alexeevich: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Klingebiel, Ward John, to Union Carbide Corporation. Dispersing apparatus. 4,014,524, Cl. 259-6.000.

Klioze, Solomon S.; and Allen, Richard C., to American Hoechst Corporation. Phenylsulfenylpiperazines. 4,015,004, Cl. 424-250.000.

Klomp, Edward D., to General Motors Corporation. Rich-core stratified charge spark ignition engine with rich mixture scoop. 4,014,300, Cl. 123-30.00C.

Klose, Dirk R.: *See—*
Siverhus, Ardell V.; Matava, Joseph A.; and Klose, Dirk R., 4,015,259.

Knief, Gerald L.: *See—*
Peterson, Jerry D.; and Knief, Gerald L., 4,014,365.

Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., to Ko An, Inc. Control for activating motor vehicle electrical load. 4,015,137, Cl. 307-10.0LS.

Knight, Bruce L.: *See—*
Fullinwider, James H.; and Knight, Bruce L., 4,014,801.

Knobbe, Karl-Heinz: *See—*
Beckert, Alexander; and Knobbe, Karl-Heinz, 4,014,732.

Knodle, Faye L.: *See—*
Cheever, Douglas L.; and Knodle, Faye L., 4,014,512.

Knowles, Richard Norris, to Du Pont de Nemours, E. I., and Company. Chemical fire alarm. 4,015,015, Cl. 424-324.000.

Ko An, Inc.: *See—*
Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., 4,015,137.

Kobashi, Uichiro, to Aisin Seiki Co., Ltd. Hydraulic brake booster. 4,014,171, Cl. 60-547.000.

Kobe Stee. Ltd.: *See—*
Asa[illegible], Akira; Yamamura, Takashige; and Tatsuno, Kenzou, 4,014,443.

Kobres, Adolph, Jr., to Exxon Research and Engineering Company. Triple pipe low temperature pipeline. 4,014,369, Cl. 138-112.000.

Koch, Friedrich-Karl; and Schneiders, Hugo, to Peltzer & Ehlers. Ejector mechanism for ejecting pressed parts from the bottom die of press. 4,014,203, Cl. 72-427.000.

Koch, Robert E.: *See—*
Rusk, Gerald R.; and Koch, Robert E., 4,014,090.

Kochanowski, George A., to United States Gypsum Company. Structure for slidable doors having snap-mounted glide retainer. 4,014,377, Cl. 160-186.000.

Kochanowski, George A., to United States Gypsum Company. Structure for slidable doors having glide retainer integral with door panel. 4,014,378, Cl. 160-186.000.

Kochsiek, Adolf; and Wilhelm, Franz, to Wikotool-Systemtechnik Maschinenbau GmbH & Co. KG. Eccentric positioning device for tools and workpieces. 4,014,439, Cl. 214-1.00R.

Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, to Ciba-Geigy Corporation. 6-Acylamino-penam-3-carboxylic and 7-acylamino-3-cephem-4-carboxylic acids. 4,015,000, Cl. 424-246.000.

Kodera, Yoichi; and Toyoda, Tetsuo, to Sony Corporation. Method and apparatus for an electret transducer. 4,014,091, Cl. 29-592.000.

Koehring GmbH - BOMAG Division: *See—*
Vural, Gulertan; and Carle, Udo, 4,014,620.

Koerner, John A.; Scherer, James P.; Stoddard, Donald J.; and Voronoff, George N., to Textron, Inc. Dual polarized blade antenna. 4,015,263, Cl. 343-708.000.

Koerner, John A., to Textron, Inc. Dual mode broadband antenna. 4,015,264, Cl. 343-725.000.

Kogyo Gijutsuin: *See—*
Hayashi, Yutaka; and Tarui, Yasuo, 4,015,283.

Kohler, Alfred: *See—*
Jurowski, Willi; Kohler, Alfred; Prohaska, Hans; and Schrade, Eugen, 4,014,061.

Kohriyama, Yoshimasa, to Caterpillar Mitsubishi Ltd. Mounting device for elastically mounting cab. 4,014,588, Cl. 296-35.00R.

Koike Sanso Kogyo Co., Ltd.: *See—*
Sugiyama, Noboru; Watanabe, Yoshitugu; and Yamamoto, Hiroshi, 4,014,528.

Kojima, Makoto: *See—*
Suzuki, Yasuhiro; Okamoto, Toshihide; Noda, Yuzuru; and Kojima, Makoto, 4,014,832.

Koleske, Joseph Victor: *See—*
Smith, Oliver Wendell; Koleske, Joseph Victor; and Brezinski, Julius John, 4,014,956.

Kollman, Delhardt K., to Brunswick Corporation. Exhaust tube mounting apparatus for outboard motors. 4,014,282, Cl. 115-.50E.

Kolomoets, Nikolai Vasilievich: *See—*
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.

KOMET Stahlhalter-und Werkzeugfabrik, Robert Breuning GmbH: *See—*
Eckle, Otto, 4,014,623.

Kondo, Osamu; Hashimoto, Torao; and Hasegawa, Hajime, to Bridgestone Tire Company Limited. Process for obtaining a polyol-containing homogeneous liquid composition useful for the production of rigid polyurethane foam from a rigid polyurethane foam. 4,014,809, Cl. 252-182.000.

Kondo, Shinichi: *See—*
Umezawa, Hamao; Maeda, Kenji; and Kondo, Shinichi, 4,014,769.

Konishiroku Photo Industry Co., Ltd.: *See—*
Akiyama, Mitsuo; and Kasuya, Masamitsu, 4,014,538.

Kononets, Boris Ivanovich: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Koponen, Martti; and Veijonen, Lassi, to Valmet Oy. Structure for transferring a web from the press section to the drying section of a paper machine. 4,014,740, Cl. 162-289.000.

Koppy Corporation: *See—*
Good, William K.; and Harbage, Wilson J., 4,014,619.

Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, to Ciba-Geigy Corporation. Stilbene compounds. 4,014,871, Cl. 260-240.00C.

Korte, Siegfried: *See—*
Miessen, Ralf; Blankenstein, Gunter; Korte, Siegfried; and Suling, Carlhans, 4,014,958.

Kosakai, Tamajiro, to France Bed Co., Ltd. Mattress covering sewing machine. 4,014,273, Cl. 112-3.00R.

Kosakai, Tamajiro, to France Bed Co., Ltd. Method and machine for sewing together mattress covers. 4,014,274, Cl. 112-3.00R.

Koschatzky, Bruno; and Angioletti, Attilio, to Industrie Pirelli S.p.A. Upholstery articles and process for their manufacture. 4,015,041, Cl. 428-310.000.

Kosmos, Peter: *See—*
Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., 4,014,690.

Kosugi, Hideaki: *See—*
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, 4,014,802.

Kosugi, Mitosi: *See—*
Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, 4,014,102.

Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resin compositions. 4,014,842, Cl. 260-29.6RB.

Kosuke, Yamashita: *See—*
Shigeyoshi, Miyamoto; Kosuke, Yamashita; Kunihisa, Fujiwara; and Tatsuo, Utsumi, 4,014,641.

Kotani, Koichi: *See—*
Sawada, Koshichi; Kajikawa, Masahiro; and Kotani, Koichi, 4,015,019.

Koyamd, Hideo: *See—*
Oda, Tatsuharu; Iwasaki, Yukio; Koyamd, Hideo; Maruyama, Shigeo; Matsubara, Takashi; Hozumi, Keiichi; and Kano, Hiroya, 4,014,495.

Koyanagi, Yukio, to Matsushita Electric Industrial Co., Ltd. Voltage generating system. 4,015,192, Cl. 323-19.000.

Kozawa, Akiya: *See—*
Langan, Richard Allen; Smilanich, Nicholas Joseph; and Kozawa, Akiya, 4,015,055.

Kozuki, Susumu: *See—*
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; Uchidoi, Masanori; Ito, Tadashi; and Iura, Yukio, 4,015,198.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant polymeric additives. 4,014,836, Cl. 260-29.6TA.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant polymeric additives. 4,014,837, Cl. 260-29.6TA.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant polymeric additives. 4,014,838, Cl. 260-29.6TA.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant polymeric additives. 4,014,839, Cl. 260-29.6TA.

Kraftwerk Union Aktiengesellschaft: *See—*
Fork, Kurt, 4,015,186.

Kratz, Karl R.: *See—*
Rohlf, Vincent E.; Kratz, Karl R.; and Hucek, Richard F., 4,014,271.

Kravchenko, Leonid Grigorievich: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Krebs, Erich. Apparatus for measuring and for wireless transmission of measured values from a bore hole transmitter to a receiver above-ground. 4,015,234, Cl. 340-18.0NC.

Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. 3(2H)-Isoquinolones therapeutic process. 4,015,006, Cl. 424-258.000.

Krejci, Milos: *See—*
Tesarik, Karel; and Krejci, Milos, 4,014,793.

Krejcir, Oldrich; Bures, Miroslav; and Jerabek, Alois, to Vysoka skola strojni a textilni. Resilient load-bearing support for a vehicle. 4,014,533, Cl. 267-120.000.

Kresta, Erich: *See—*
Gorter, Werner; Kresta, Erich; and Stumpf, Horst, 4,014,969.

Kreuter, Walter: *See—*
Dorner, Armin; and Kreuter, Walter, 4,014,749.

Krey, Winfried, to Varta Batterie Aktiengesellschaft. Depolarizer mass for galvanic primary cells. 4,014,810, Cl. 252-182.100.

Kristiansen, Kai Hestbech. Corner structure. 4,014,618, Cl. 403-205.000.

Kroyer, Karl Kristian Kobs. Apparatus for the deposition of a uniform layer of dry fibres on a foraminous forming surface. 4,014,635, Cl. 425-82.000.

Krugly, Samuil Markovich: *See—*
Volodin, Nikolai Lvovich; Polak, Lev Solomonovich; Endjuskin, Petr Nikolaevich; Levenzon, Rafail Izrailevich; Krugly, Samuil Markovich; and Dyatlov, Viktor Trofimovich, 4,014,947.

Krummacher, Gottfried. Board game apparatus. 4,014,554, Cl. 273-134.0AD.

Kubba, Ved Parkash, to Ciba-Geigy Corporation. Heterocyclic substituted azo dyestuff. 4,014,864, Cl. 260-157.000.

Kubo, Masaharu: *See—*
Nagata, Minoru; Masuhara, Toshiaki; Kubo, Masaharu; and Hashimoto, Norikazu, 4,015,281.

Kubota, Hidetsugu. Method and device for restraining nitrogen oxide production in combustion gas of internal combustion engines. 4,014,299, Cl. 123-25.00P.

Kuchenmeister, Rolf: *See—*
Kaiser, Bernd-Ulrich; Dhein, Rolf; Kuchenmeister, Rolf; and Fischler, Hans-Michael, 4,014,708.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Sputtering apparatus. 4,014,779, Cl. 204-298.000.

Kugler, Tibor; and Rieger, Hans Wolfhart, to Swiss Aluminium Ltd. Conductor rail. 4,014,417, Cl. 191-29.0DM.

Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. N-carboxylated N-methylcarbamic acid aryl esters. 4,014,923, Cl. 260-479.00C.

Kuhnlein, Hans L.: *See—*
Guth, Hans; Kaiser, Hans-Joachim; Kleine-Weischede, Klaus; Wieschen, Hermann; and Kuhnlein, Hans L., 4,014,735.

Kunihisa, Fujiwara: *See—*
Shigeyoshi, Miyamoto; Kosuke, Yamashita; Kunihisa, Fujiwara; and Tatsuo, Utsumi, 4,014,641.

Kunstmann, Rudolf; and Kaiser, Joachim, to Hoechst Aktiengesellschaft. Basically substituted 3,4-dihydro-2H-isoquinolin-1-thiones. 4,014,884, Cl. 260-288.0CE.

Kunze, Dieter, to Jean Waltersheid GmbH. Coupling hook for a three-point connection on a tractor. 4,014,562, Cl. 280-508.000.

Kuojarvi, Kalervo. Chain-like rescue devices particularly for small boats. 4,014,057, Cl. 9-14.000.

Kupfer, Hans; Lange, Paul; and Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Reactor for the pressure gasification of coal. 4,014,664, Cl. 48-63.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujimaki, Hiroto; Hayashi, Haruhisa; and Kawahara, Takashi, 4,014,980.

Kurpanek, Horst G.; and Cone, Gail P. Multi-processing computer system. 4,015,243, Cl. 340-172.500.

Kuwabara, Kiyoteru: *See—*
Sasaki, Akio; Kuwabara, Kiyoteru; and Kiwaki, Hisakatsu, 4,015,187.

Kyowa Yuka Co., Ltd.: *See—*
Tanaka, Kazuaki; Ishida, Yasuto; Yanagi, Kimiyoshi; Kassai, Noriaki; and Tanaka, Toshiyuki, 4,014,941.

Laboratoire Roger Bellon: *See—*
Pesson, Marcel; and Techer, Henri, 4,015,002.

Laboratoires Andre Guerbet: *See—*
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,014,986.

Laboratoires Pharmascience: *See—*
Gazave, Jean-Maurice; Rancurel, Alain; and Grenier, Georges, 4,015,017.

Labovitz, Jeffery N.; and Henrick, Clive A., to Zoecon Corporation. Novel acetal. 4,014,942, Cl. 260-615.00A.

Labovitz, Jeffery N.; and Henrick, Clive A., to Zoecon Corporation. Synthesis of 1-bromonon-4-en-6-yne. 4,014,946, Cl. 260-654.00R.

LaCroce, Leonard Thomas, to American Can Company. Accurate flow control container means. 4,014,455, Cl. 220-269.000.

Lagasse, Jean; Clot, Jean; Falipou, Jean; Loubieres, Andre; Rabischong, Pierre; Richard, Jean-Pierre; and Bui, Ai, to Agence Nationale de Valorisation de la Recherche Etablissement Public de Droit. Tactile pick-up. 4,014,217, Cl. 73-432.00R.

Lagonigro, Mauro: *See—*
Husse, Massimo; and Lagonigro, Mauro, 4,014,210.

Lagunilla, Carlos. Cover for cooking kettles. 4,014,315, Cl. 126-275.00R.

Laird, William F.: *See—*
Walsh, David I.; Casey, James P.; Corneau, George E.; and Laird, William F., 4,014,648.

Lakey, Larry: *See—*
Woods, Francis J., 4,015,085.

Lamar, Richard Seyb: *See—*
Bell, George Richard; and Lamar, Richard Seyb, 4,014,788.

Lamberti, Vincent; and Urban, Warren J., to Lever Brothers Company. Foods with substituted succinic acid compounds. 4,015,023, Cl. 426-531.000.

Lambrix, Maurice A.: *See—*
Hitchcock, Morley; and Lambrix, Maurice A., 4,014,077.

Landry, Robert Joseph; Bostrom, Robert G.; and Peterson, Richard W., to United States of America, America. Method and apparatus for monitoring optical radiation. 4,015,130, Cl. 250-372.000.

Lane, Ralph D.: *See—*
Davidson, Evan E.; and Lane, Ralph D., 4,015,147.

Lang, Karl, to Siemens Aktiengesellschaft. Cover and base arrangement for an electrical machine. 4,015,155, Cl. 310-89.000.

Langan, Richard Allen; Smilanich, Nicholas Joseph; and Kozawa, Akiya, to Union Carbide Corporation. Metal oxide cells having low internal impedance. 4,015,055, Cl. 429-145.000.

Lange, Gerhard: *See—*
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Lange, Paul: *See—*
Kupfer, Hans; Lange, Paul; and Rudolph, Paul, 4,014,664.

Langenstein & Schemann Aktiengesellschaft: *See—*
Herrmann, Karl-Heinz, 4,014,198.

Langer, Arthur W., Jr.: *See—*
Feldman, Nicholas; and Langer, Arthur W., Jr., 4,014,663.

Langevin, Donald R. Electrical counting scale. 4,014,397, Cl. 177-200.000.

Langlitz, Karlheinz; and Schmitz, Gunter, to Demag Aktiengesellschaft. Protective nozzle for metallurgic vessels, particularly for steel mill converters. 4,014,530, Cl. 266-241.000.

Laporte, Jean-Claude: *See—*
Laporte, Jean-Michel; and Laporte, Jean-Claude, 4,014,310.

Laporte, Jean-Michel; and Laporte, Jean-Claude. Transportable target throwing apparatus. 4,014,310, Cl. 124-6.000.

Lapp, Ellsworth W. Cable tensioning device. 4,014,518, Cl. 254-69.000.

Lara, Jose Hector; and Williams, Edward B., Jr. Spark plug having electrodes shaped to produce a hollow spark column. 4,015,160, Cl. 313-139.000.

Larsen, Ingrid A.: *See—*
Furgal, Henry P.; and Larsen, Ingrid A., 4,014,105.

Larsen's Manufacturing Company: *See—*
Fudge, William L., 4,015,250.

Larson, Charles O., to Charles O. Larson Co. Flattened round end staple. 4,014,244, Cl. 85-49.000.

Laurent, Jean; and Villain, Francois, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Pressure sensor of low sensitivity with respect to acceleration. 4,015,233, Cl. 340-10.000.

Lautrou, Jean: *See—*
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,014,986.

Laxo, Darryl E., to United States of America, Navy. Attitude control system for seagoing vehicles. 4,014,280, Cl. 114-124.000.

Lazo-Wasem, Edgar A.: *See—*
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Le Materiel Magnetique: *See—*
Cotton de Bennetot, Michel, 4,015,174.

Lear Siegler, Inc.: *See—*
Costin, Robert W., 4,014,593.

LeBrun, Michel A., Jr.: *See—*
Hadley, John R.; LeBrun, Michel A., Jr.; McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,014,449.

Lee, Sam S.: *See—*
Karayannis, Nicholas M.; Turner, James A.; and Lee, Sam S., 4,015,060.

Lee, Yuan Ho. Feeding device for high speed nut formers. 4,014,058, Cl. 10-76.00T.

Legeai, Jacky Marcel Gerard: *See—*
Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel Gerard, 4,014,909.

Lehnhoff, Hans F., to Schlage Lock Company. Thumbturn and assembly and method of providing a thumbturn. 4,014,573, Cl. 292-347.000.

Lehrer, Erwin: *See—*
Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,014,084.
Leibenzeder, Siegfried; and Schwarzmichel, Klaus-Dieter, to Siemens Aktiengesellschaft. Monitoring device for crystal pulling apparatus. 4,014,656, Cl. 23-273.0SP.
Leidig, Theodor, to Haarmann & Reimer GmbH. 4-Tricyclo[5,2,1,$0^{2,6}$]decyl-8-butanal. 4,014,938, Cl. 260-598.000.
Leigh, Theodore M., to FMC Corporation. Hydraulic jack with mechanical locking device. 4,014,519, Cl. 254-86.00H.
Lejdegard, Sixten H.; and Henriksson, Nils E., to Bulten-Kanthal Aktiebolag. Power-driven screwdriver. 4,014,225, Cl. 81-57.370.
Lemke, Charles H.: *See—*
Clare, Norval D.; and Lemke, Charles H., 4,014,687.
Lentz, James A.: *See—*
Seanor, Donald A.; Lentz, James A.; and Meagher, Thomas, 4,014,606.
Le Page, Yvon: *See—*
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Lerner, Bernard, to Automated Packaging Systems, Inc. Packaging method and apparatus. 4,014,154, Cl. 53-29.000.
Lerner, Robert W.: *See—*
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Muntz, Ronald L.; and Lerner, Robert W., 4,014,912.
Les Bernard, Inc.: *See—*
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Letelier, Carlos Sunkel; and Grafulia, Fernando Cillero, to Alter, S.A. O-Acetoxy benzoate ester of 2(p-acetamido-phenyloxy)ethyl alcohol. 4,014,921, Cl. 260-473.00R.
Levenzon, Rafail Izrailevich: *See—*
Volodin, Nikolai Lvovich; Polak, Lev Solomonovich; Endjuskin, Petr Nikolaevich; Levenzon, Rafail Izrailevich; Krugly, Samuil Markovich; and Dyatlov, Viktor Trofimovich, 4,014,947.
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Lamberti, Vincent; and Urban, Warren J., 4,015,023.
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Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Oil filter adapter. 4,014,794, Cl. 210-199.000.
Leypold, Dieter: *See—*
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Li, Norman N.; Singhal, Gopal H.; Minday, Richard M.; and Gorbaty, Martin L., to Exxon Research and Engineering Company. Novel liquid membrane formulations and uses thereof. 4,014,785, Cl. 210-22.00D.
Lin, Kang: *See—*
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Lind, Walter: *See—*
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Lindauer Dornier Gesellschaft mbH.: *See—*
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Linde Aktiengesellschaft: *See—*
Dorner, Armin; and Kreuter, Walter, 4,014,749.
Linde, Hans; and Maecker, Horst, to H. Berthold A.G. Type carriers. 4,015,273, Cl. 354-15.000.
Lions, Noel, to Commissariat a l'Energie Atomique. Steam generator. 4,014,295, Cl. 122-32.000.
Liu, Gordon Y. T.; and Strange, Carl P., to Dow Chemical Company, The. Method of preparing polysaccharide ethers and apparatus. 4,015,067, Cl. 536-96.000.
Liu, Robert Chung-Huan: *See—*
Hughes, John Lawrence; and Liu, Robert Chung-Huan, 4,014,934.
Livak, John E.; and Budde, Paul B., to Dow Chemical Company, The. [(2-Alkoxyberzylidine)amino]quanidines and their anticoccidal use. 4,015,016, Cl. 424-326.000.
Lochte, Glen E.: *See—*
Arnold, James F.; Lochte, Glen E.; and Duncan, Anthony B., 4,014,567.
Kelly, James A.; Ames, Thomas J.; Lochte, Glen E.; and Bowen, Burlie R., 4,014,180.
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Lockheed Aircraft Corporation: *See—*
Blad, Leiv H.; and Warkow, Robert F., 4,015,035.
Lohmann, Ernst; and Sacht, Hans-Joachim, to Berkel GmbH. Weighing apparatus. 4,014,396, Cl. 177-169.000.
Lohse, Friedrich: *See—*
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Lomax, Ronald W., to International Standard Electric Corporation. Encapsulated electromechanical relay. 4,015,225, Cl. 335-133.000.
Lorenz, Donald H.: *See—*
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Lorenz, Roland: *See—*
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Lotz, Robert E. Reamer, 4,014,622, Cl. 408-127.000.
Loubet, Jacques Charles, to Saint-Gobain Industries. Apparatus for producing multiple pane windows. 4,014,733, Cl. 156-446.000.
Loubieres, Andre: *See—*
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Lowe, Bryan Wilfred Hodson, to Imperial Metal Industries (Kynoch) Limited. Cathode and hanger bar assembly and electrolysis therewith. 4,014,763, Cl. 204-106.000.
Lowe, Edward James: *See—*
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Lucas Electrical Company Limited, The: *See—*
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Holt, William David, 4,015,136.
Ludlum, Lorren F., to Falstad, William J.; Mellon, Kenneth L.; and Spohn, Russel, part interest to each. Padding machine. 4,014,288, Cl. 118-6.000.
Lundberg, Robert D.; Makowski, Henry S.; and Westerman, Lowell, to Exxon Research and Engineering Company. Ionic polymer plasticized with preferential plasticizers. 4,014,847, Cl. 260-33.40R.
Lundin, Robert S.; and Carragan, John F., to General Time Corporation. Firing circuit. 4,015,193, Cl. 323-19.000.
Lupia, Arthur W.; Gonzalez, Jesus; and Thurman, Garrett, to Border Steel Mills, Inc. Ball rounding apparatus. 4,014,197, Cl. 72-92.000.
Lynch, William C., to Clamco Corporation. Film dispenser and cutoff. 4,014,229, Cl. 83-16.000.
M. Scaglia S.p.A.: *See—*
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McMullen, Warren H.; and Mooney, Thomas J., 4,014,759.
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Ma, John Y., to Zenith Radio Corporation. Television receiver automatic frequency control system. 4,015,075, Cl. 358-158.000.
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MacKenzie, Kenneth W. Vehicle bumper system. 4,014,582, Cl. 293-84.000.
MacNeill, Roderick M. Lighter-than-air craft. 4,014,483, Cl. 244-5.000.
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Magnaghi, Sergio; Felci, Eustorgio; and Ferrari, Rodolfo, to SPA-Societa Prodotti Antibiotici S.p.A. Process for the recovery and purification of partricin. 4,014,994, Cl. 424-123.000.
Magnavox Company, The: *See—*
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Majewski, Edward Adam, to Phosphate Co-operative Company of Australia Ltd., The. Process for the production of elemental phosphorus and iron from phosphate rock. 4,014,682, Cl. 75-29.000.
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Mallinckrodt, Inc.: *See—*
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Malmo Testequipment AB: *See—*
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Fullinwider, James H.; and Knight, Bruce L., 4,014,801.
Marcella, Joseph: *See—*
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March, Wayne F. Non-invasive glucose sensor system. 4,014,321, Cl. 128-2.00A.

Marcus, Douglas Larry. Breathing gas heater for use by a diver comprising double walled cylinder and inner container filled with hot liquid prior to use. 4,014,384, Cl. 165-104.00S.
Marecek, Miroslav: *See—*
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Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., to Union Carbide Corporation. Separation of liquid phases. 4,014,789, Cl. 210-84.000.
Martel, Jacques, to Roussel-UCLAF. Process for the preparation of cyclopropane derivatives and compounds produced therein. 4,014,918, Cl. 260-468.00H.
Marthaler, Max, to Ciba-Geigy AG. Method for processing silver dye bleach materials. 4,014,698, Cl. 96-53.000.
Martin, Francis W., to Corning Glass Works. Ceramic articles having cordierite coatings. 4,015,048, Cl. 428-428.000.
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Massar, Ernst, to Siemens Aktiengesellschaft. Current limiting device for an electrical network. 4,015,168, Cl. 361-19.000.
Mast, John George, Jr.; and Green, Paul James, to Procter & Gamble Company, The. Disposable product applicator and dispensing package therefor. 4,014,616, Cl. 401-292.000.
Masuda, Kenzo, to Hitachi, Ltd. Frequency-voltage converter and a stabilized pulse generator using it. 4,015,216, Cl. 331-8.000.
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Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.
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Matsushita, Takeshi; and Mamine, Takayoshi, to Sony Corporation. Multi-layer semiconductor photovoltaic device. 4,015,280, Cl. 357-30.000.
Matter, Robert C.; and Spangler, Larry D., to General Motors Corporation. Apparatus for making intercell connectors by an extrusion-fusion technique. 4,015,098, Cl. 219-90.000.
Matty, Thomas C.; and Sahasrabudhe, Arun P., to Westinghouse Electric Corporation. Multi-channel signal decoder. 4,015,082, Cl. 178-66.00R.
Mauger, David W., to Clevepak Corporation. Die-set assembly. 4,014,232, Cl. 83-144.000.
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Alkyl-O-pyrimidin (2)yl-thionophosphonic acid esters. 4,014,996, Cl. 424-200.000.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Alkyl-S-(2-(1,1,2-trifluoro-2-chloroethylmercapto)-ethyl)(thiono)(di) thiolphosphoric (phosphonic) acid esters and ester-amides and pesticidal use. 4,014,998, Cl. 424-216.000.
Mayer, Ludwig A. Crystal structure model. 4,014,110, Cl. 35-18.00A.
McCombs, Frank Paul, to Owens-Corning Fiberglas Corporation. Composition comprising a blend of a resorcinol-aldehyde resin; an elastomer and an organo silicon coupling system. 4,014,835, Cl. 260-29.300.
McCord, James W. Vapor generating and recovering apparatus. 4,014,751, Cl. 202-160.000.
McCoy, Drew E., to Texaco Inc. Recovery of oil from refinery sludges by steam distillation. 4,014,780, Cl. 208-13.000.
McDonnell Douglas Corporation: *See—*
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McDonough, William F.; Montlick, James A.; and Bernard, Richard A., to Pitney-Bowes, Inc. Multi-detectable ink compositions and method of use. 4,015,131, Cl. 250-461.00R.
McGrane, George M. Hose nozzle diverter. 4,014,471, Cl. 239-510.000.
McIntyre, David J. Instrument for aspirating and irrigating during ophthalmic surgery. 4,014,333, Cl. 128-240.000.
McKelvey, Harold E.; and Maciejewski, Leonard B., to Shatterproof Glass Corporation. Oven door windows. 4,014,312, Cl. 126-198.000.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted pyridine carboxylic acids and derivatives. 4,014,888, Cl. 260-294.80F.
McKnight, Jimmy, to Fulghum Industries, Inc. Sequential operator for clutch and brake. 4,014,419, Cl. 192-13.00R.
McLachlan, Ian, to Dow Chemical Company, The. Process for preparing cyclicdicarboximido-substituted phosphonothioates. 4,014,897, Cl. 260-326.00E.
McMullen, Warren H.; and Mooney, Thomas J., to M & T Chemicals Inc. Electroplating iron alloys containing nickel, cobalt or nickel and cobalt. 4,014,759, Cl. 204-43.00T.
McNulty, Frank E. Outer wrap for pipelines. 4,014,370, Cl. 138-144.000.
McRoskey, John W.: *See—*
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McRoskey, Leonard H.: *See—*
Hadley, John R.; LeBrun, Michel A., Jr.; McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,014,449.
McWhirter, Olin P. Combination digger, trimmer, and edger tool. 4,014,391, Cl. 172-13.000.
Mead Johnson & Company: *See—*
Kreighbaum, William E.; and Comer, William T., 4,015,006.
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Mecca, Vito M., 4,014,160.
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Medvedev, Valentin Valentinovich: *See*—
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Megahed, El Sayed; and Spellman, Patrick Joseph, to ESB Incorporated. Method of manufacturing a stable divalent silver oxide depolarizer mix. 4,015,056, Cl. 429-219.000.
Meier, Max: *See*—
Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 4,014,699.
Meininger, Fritz; and Schlafer, Ludwig, to Hoechst Aktiengesellschaft. Golden-yellow fiber-reactive water-soluble monoazo dyestuffs. 4,014,865, Cl. 260-163.000.
Meisels, Alex: *See*—
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Mercurio, Luigi; and Ravasio, Piercarlo, to Ing. C. Olivetti & C., S.p.A. Biprogrammable electronic accounting machine. 4,015,245, Cl. 340-172.500.
Meridian Industries, Inc.: *See*—
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Meyer, Burton C.; and Copeland, Leigh, to Marvin Glass & Associates. Craft device for making aerial projectiles from sheet material. 4,014,251, Cl. 93-1.00R.
Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Carrier wave compensator with interference suppression circuit means. 4,015,209, Cl. 328-162.000.
Meyer, Edward P.; and Wright, William L., to Picker Electronics, Inc. Sector scanning ultrasonic inspection apparatus. 4,014,207, Cl. 73-67.80S.
Meyer, Hans Rudolf, to Ciba-Geigy Corporation. Tolane compounds. 4,014,644, Cl. 8-1.00W.
Meyer, Hans Rudolf, to Ciba-Geigy Corporation. Stilbene compounds. 4,014,870, Cl. 260-240.0CA.
Michigan Chemical Corporation: *See*—
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Microfibres, Inc.: *See*—
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Miessen, Ralf; Blankenstein, Gunter; Korte, Siegfried; and Suling, Carlhans, to Bayer Aktiengesellschaft. Dry-spun modacrylic filaments with improved coloristic properties. 4,014,958, Cl. 260-898.000.
Mifsud, Joseph F., to Exxon Production Research Company. Vibratory apparatus for use in seismic exploration. 4,014,403, Cl. 181-114.000.
Migita, Ken: *See*—
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Miles Laboratories Inc.: *See*—
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Milkovic, Miran, to General Electric Company. Multiplier for producing phase shift error-free signal representing product of out-of-phase inputs. 4,015,140, Cl. 307-229.000.
Millauer, Hans, to Hoechst Aktiengesellschaft. Process for the preparation of hexafluoropropene epoxide. 4,014,762, Cl. 204-79.000.
Miller, Aaron: *See*—
Juliano, Angelo L.; and Miller, Aaron, 4,014,995.
Miller, Dale Lloyd, to International Telephone and Telegraph Corporation. Resettable overcurrent-protected direct current power supply. 4,015,171, Cl. 361-18.000.
Miller, Harold N.; and Wisotsky, Max J., to Exxon Research and Engineering Company. Polymer combinations useful in fuel oil to improve cold flow properties. 4,014,662, Cl. 44-62.000.
Miller, Ralph L., to United States of America, Army. Ordnance training aid. 4,014,111, Cl. 35-25.000.
Miller, Robert S.: *See*—
Feldman, Martin L.; and Miller, Robert S., 4,015,064.
Miller, William Clyde, to Johns-Manville Corporation. Insulating refractory fiber composition and articles for use in casting ferrous metals. 4,014,704, Cl. 106-38.220.
Millier, William F.; Rehkugler, Gerald E.; Pellerin, Roger A.; and Throop, James A., to Cornell Research Foundation, Inc. High capacity harvesting apparatus. 4,014,440, Cl. 214-6.00H.
Milo, August. Pipe cap. 4,014,367, Cl. 138-89.000.
Milsco Manufacturing Company: *See*—
Swenson, Richard F., 4,014,507.
Miltenberger, Robert S., to National Steel Corporation. Method of making Drawing Quality steel. 4,014,683, Cl. 75-49.000.
Minakuchi, Hiroshi: *See*—
Tetsugu, Yoshio; Mitsui, Tsunemi; and Minakuchi, Hiroshi, 4,015,180.
Mincey, Everett K.: *See*—
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Misencik, John J., to Westinghouse Electric Corporation. Two pole ground fault circuit interrupter with improved rectified supply and transient suppression for a trip circuit. 4,015,169, Cl. 361-45.000.
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Miyake, Teruhiko, to Nihon Beru-Haueru Kabushiki Kaisha. Under exposure and fade indicator. 4,015,119, Cl. 250-214.00D.
Miyakita, Hiroshi, to Miyakita, Ichiro. Rotary cutter drive control with electro-hydraulic pulse motor. 4,015,183, Cl. 318-601.000.
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Mobil Oil Corporation: *See—*
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Mohammed, M. Hamdi A. Dental bridge alloy. 4,014,691, Cl. 75-171.000.

Mohndruck, Reinhard Mohn oHG, Firma: *See—*
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Mohr, Walter, to Braun Aktiengesellschaft. Impact mechanism for piezoelectric transducers. 4,015,152, Cl. 310-8.700.

Mohrhauser, John P.: *See—*
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Monarch Tool & Manufacturing Company: *See—*
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Mondshine, Thomas C., to N L Industries, Inc. Method of simultaneously strengthening the surface of a borehole and bonding cement thereto and method of forming cementitious pilings. 4,014,174, Cl. 61-53.520.

Monks, Harry, to Coal Industry (Patents) Limited. Brakes for vehicles. 4,014,413, Cl. 188-170.000.

Mono-Probe Corporation: *See—*
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Monroe, John N.: *See—*
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Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., to International Flavors & Fragrances Inc. π-Tricyclene-9-alkanone perfumes. 4,014,823, Cl. 252-522.000.

Mooney, Thomas J.: *See—*
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Moore, Alvin Edward. Low-cost, ruggedly simple, overturn-preventing vehicle. 4,014,401, Cl. 180-22.000.

Moore, John F.; and Coate, Forrest M., to Rockwell International Corporation. Ultrasonic system for measuring dimensional or stress change in structural member. 4,014,208, Cl. 73-67.900.

Moore, Peter F.: *See—*
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Moore, Robert A.: *See—*
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Moore-Searson, Leslie Donald, to Elliott Brothers (London) Limited. Display devices. 4,015,080, Cl. 358-104.000.

Moore, William Percy, to Allied Chemical Corporation. Recovery of dicarboxylic acids from aqueous solution containing nitric acid. 4,014,903, Cl. 260-345.900.

Moore, William Stanley; and Hinshaw, Waldo Stephen, to National Research Development Corporation. Analysis of materials. 4,015,196, Cl. 324-.50R.

Moorhead, Seth B., Jr.: *See—*
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Moraw, Roland; Schadlich, Gunther; and Horn, Klaus, to Hoechst Aktiengesellschaft. Method of holographic recording. 4,014,603, Cl. 350-3.500.

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Morinaga Milk Industry Co., Ltd.: *See—*
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Morinaga, Shigeki; and Onishi, Kazuo, to Hitachi, Ltd. Control apparatus for sewing machine with automatic needle stopping means. 4,014,277, Cl. 112-219.00A.

Morishita, Yasomatsu, to Ryobi, Ltd. Reel mechanism. 4,014,422, Cl. 192-67.00R.

Moriya, Norihiko: *See—*
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Schwan, Thomas J.; Davis, Charles S.; and Honkomp, LeRoy J., 4,014,886.

Morton, Roger Roy Adams, to Bausch & Lomb Incorporated. Methods of and apparatus for determining the physical parameters of selected objects. 4,015,108, Cl. 235-92.0PC.

Moser, Raymond L.: *See—*
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Moser, Robert D. Photograph holder. 4,014,121, Cl. 40-158.00R.

Moser, Vincent J.: *See—*
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Motorola, Inc.: *See—*
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Mouille, Rene Louis, to Societe Nationale Industrielle Aerospatiale. Vibration attenuating suspension system for rotary-wing aircraft rotors. 4,014,484, Cl. 244-17.270.

Moyer, Joseph R. Workman's break-away safety apron. 4,014,045, Cl. 2-51.000.

Mueller, Thomas L.: *See—*
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Muller, Robert, to Cameco AB. Respirator system. 4,014,326, Cl. 128-145.600.

Muntz, Ronald L.; and Lerner, Robert W., to Stauffer Chemical Company. Method for preparing ethyl vanadate. 4,014,911, Cl. 260-429.00R.

Muntz, Ronald L.; and Lerner, Robert W., to Stauffer Chemical Company. Method for preparing organic vanadates. 4,014,912, Cl. 260-429.00R.

Murata Manufacturing Co., Ltd.: *See—*
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Murray, James M.: *See—*
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Murrmann, Helmuth; and Schwabe, Ulrich, to Siemens Aktiengesellschaft. Method of producing a monolithic semiconductor device. 4,014,714, Cl. 148-1.500.

Musha, Keijiro; and Maeda, Hajime, to Almer Sangyo Kaisha, Ltd. Rotary kiln. 4,014,643, Cl. 432-118.000.

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Musselman, Camillus B.; and Bovier, Edward M., to Anheuser-Busch, Incorporated. Corrugating adhesive composition. 4,014,727, Cl. 156-205.000.

Muto, Goro, to Tanaka Kogyo Kabushiki Kaisha. Bicycle engine. 4,014,402, Cl. 180-33.00D.

Muto, Iwao, to Toshiba Seiki Kabushiki Kaisha. Apparatus for binding articles with tape. 4,014,731, Cl. 156-350.000.

Myers, John W., to Phillips Petroleum Company. Hydrocarbon conversion process utilizing group VIII metal/alumina catalysts activated with hydrogen halide/halosilane/organic halide. 4,014,948, Cl. 260-666.00P.

N L Industries, Inc.: *See—*
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Nadelson, Jeffrey: *See—*
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Naf, Ferdinand; Ohloff, Gunther; and Eschenmoser, Albert, to Firmenich S.A. Process for the preparation of poly-unsaturated hydrocarbons. 4,014,951, Cl. 260-677.00R.

Nagaoka, Shinji; and Takazawa, Yuzuru, to Seiko Koki Kabushiki Kaisha. Electric timing circuitry with means to compensate for switch chatter. 4,015,142, Cl. 307-247.00A.

Nagasawa, Masao, to Nippondenso Co., Ltd. Capacitor discharge type contactless ignition system for internal combustion engines. 4,014,309, Cl. 123-148.0CC.

Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; and Mizota, Teruhiko, to Morinaga Milk Industry Co., Ltd. Tartar removal by electrodialysis and potassium level control in wine. 4,015,020, Cl. 426-239.000.

Nagata, Minoru; Masuhara, Toshiaki; Kubo, Masaharu; and Hashimoto, Norikazu, to Hitachi, Ltd. MIS-FETs isolated on common substrate. 4,015,281, Cl. 357-41.000.

Nagata, Takashi; Motoki, Goro; Suzuki, Morio; and Yoshino, Hiroshi, to Yamasa Shoyu Kabushiki Kaisha. Crystalline monosodium N^6,2'-O-dibutyryl-adenosine-3',5'-cyclic monophosphate and production thereof. 4,015,066, Cl. 536-27.000.

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Nashua Corporation: *See—*
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Naslund, Soren; and Bohm, Gosta Martin, to Paul Anderson Industrier

AB. Transport track and sliding carriage for moving heavy loads. 4,014,266, Cl. 104-162.000.

Nasser, Benny E.: *See—*
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National Marine Service, Inc.: *See—*
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National Research Development Corporation: *See—*
Cleaver, Brian; and Rowlands, Geoffrey John, 4,015,054.
Moore, William Stanley; and Hinshaw, Waldo Stephen, 4,015,196.

National Steel Corporation: *See—*
Miltenberger, Robert S., 4,014,683.

Nayler, Irene Mary; and Stalker, Michael, to Greengate Industrial Polymers Limited; and Nayler Limited. Floating roofs for liquid storage tanks. 4,014,454, Cl. 220-225.000.

Nayler Limited: *See—*
Nayler, Irene Mary; and Stalker, Michael, 4,014,454.

NCR Corporation: *See—*
Stewart, John W., 4,015,145.

Neal, Edwin S. Portable, straight and square, variable angle or multi-angle sawing guide. 4,014,236, Cl. 83-745.000.

Neeff, Rutger, to Bayer Aktiengesellschaft. Exhaust process for the dyeing of synthetic fibre materials. 4,014,647, Cl. 8-174.000.

Neher, Martin Duane: *See—*
Carter, J. Warne; and Neher, Martin Duane, 4,014,568.

Nelsen, John E., to Alliance Plastics, Inc. Flange protector. 4,014,368, Cl. 138-109.000.

Nelson, Neal A.; and Jacobus, Clarence E., to Boeing Company, The. Door activated airborne stair structure. 4,014,486, Cl. 244-129.600.

Nelson, Richard L., to Exxon Research and Engineering Company. Facsimile transmitter having improved response. 4,015,077, Cl. 358-280.000.

Neomed Incorporated: *See—*
Esty, Janet M., 4,014,343.

Neufeld, Manfred, to Siemens Aktiengesellschaft. Paper support roll mechanism for use in a teletypewriter or other such printing device. 4,014,426, Cl. 197-133.00R.

Newton, Albert Eugene; and Elliott, Richard Montgomery, to USM Corporation. Hot melt dispenser and method of making its melt body. 4,014,464, Cl. 222-146.0HE.

Newton, T. Lawrence, to Sunburst Solar Energy, Inc. Solar energy collector panel. 4,014,314, Cl. 126-271.000.

Nicolay, Klaus: *See—*
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Nield, Eric, to Imperial Chemical Industries Limited. Laminates of acrylonitrile/styrene copolymers. 4,015,033, Cl. 428-35.000.

Niemers, Ekkehard: *See—*
Wollweber, Hartmund; Niemers, Ekkehard; Schulz, Hans Peter; Thomas, Herbert; and Andrews, Peter, 4,015,012.

Nifco Inc.: *See—*
Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, 4,014,796.

Nihon Beru-Haueru Kabushiki Kaisha: *See—*
Miyake, Teruhiko, 4,015,119.

Nijm, William P.: *See—*
Zeineh, Rashid A.; and Nijm, William P., 4,014,610.

Nilsson, Karl Erik; and Herrmann, Gunter. Safety belt system with pyrotechnically driven turning device. 4,014,479, Cl. 242-107.40R.

Ning, Robert Ye-Fong: *See—*
Fryer, Rodney Ian; Ning, Robert Ye-Fong; Sternbach, Leo Henryk; and Walser, Armin, 4,014,883.

Nippon Electric Company, Ltd.: *See—*
Ikeda, Kiyoshi; and Mitani, Toshihiko, 4,015,205.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yokoyama, Kenji, 4,015,214.

Nippon Tungsten Co., Ltd.: *See—*
Aoki, Sueo; and Amamoto, Nobumasa, 4,014,140.

Nippondenso Co., Ltd.: *See—*
Nagasawa, Masao, 4,014,309.

Nishikawa, Sinjiro: *See—*
Kaido, Tsutomu; Asahi, Seiichi; and Nishikawa, Sinjiro, 4,014,185.

Nishimura, Takanori: *See—*
Tomozawa, Akihiro; Nishimura, Takanori; and Yamaguchi, Takashi, 4,014,718.

Nissan Motor Co., Ltd.: *See—*
Hatori, Yukiyoshi; and Sugiyama, Hiroshi, 4,014,268.
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, 4,014,802.

Nissley, William J., Jr., to All American Industries, Inc. Rocket-powered apparatus for launching a flying device. 4,014,246, Cl. 89-1.819.

Nitro Nobel A.B.: *See—*
Brunnberg, Bernt, 4,014,655.

Nitsche, Herbert, to Siemens Aktiengesellschaft. Support for mounting the electronic components of a single phase unit for an inverter. 4,015,173, Cl. 361-388.000.

Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Humidity sensitive ceramic resistor. 4,015,230, Cl. 338-35.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Suzuki, Yasuhiro; Okamoto, Toshihide; Noda, Yuzuru; and Kojima, Makoto, 4,014,832.

Nitzkowski, Norman H.: *See—*
Dockum, James M.; and Nitzkowski, Norman H., 4,014,318.

Niwa, Takao: *See—*
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Nixdorf Computer AG: *See—*
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Noda, Yuzuru: *See—*
Suzuki, Yasuhiro; Okamoto, Toshihide; Noda, Yuzuru; and Kojima, Makoto, 4,014,832.

Noguchi, Yoshio: *See—*
Odawara, Hiroyuki; Noguchi, Yoshio; and Ohno, Masaji, 4,014,711.

Nojiri, Naohiro: *See—*
Watanabe, Yoshihisa; and Nojiri, Naohiro, 4,014,766.

Noma, Shinichi: *See—*
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Nomiya, Kosei: *See—*
Kawagoe, Hiroto; and Nomiya, Kosei, 4,015,219.

Noonan, Walter F., to Westlake Plastics Co. Plastic electroplating barrel with ribbed perforate modular panels. 4,014,774, Cl. 204-213.000.

Noranda Mines Limited: *See—*
Seniuk, William; and Gagnon, Regis, 4,015,099.

Norcross, Austin S., to Norcross Corporation. Recording device with flexible chart. 4,015,268, Cl. 346-137.000.

Norcross Corporation: *See—*
Norcross, Austin S., 4,015,268.

Nordeen, Carl William: *See—*
Arendsen, David Lloyd; and Nordeen, Carl William, 4,014,658.

Northrop Corporation: *See—*
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Smith, William W.; and Monroe, John N., 4,015,258.

Norton Company: *See—*
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Nosachev, Vladimir Alexandrovich: *See—*
Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Konstantin Konstantinovich, 4,014,494.

Nubel, Robert C., to Pfizer Inc. Production of citric acid in slack wax media. 4,014,742, Cl. 195-28.00R.

Nutzel, Karl: *See—*
Haas, Friedrich; Nutzel, Karl; and Jahn, Hans-Joachim, 4,014,848.

Obara, Kunio; and Sanda, Masaru, to Mitsui Shipbuilding and Engineering Co., Ltd. Coating apparatus for bottles. 4,014,290, Cl. 118-301.000.

Obendorf, Johann: *See—*
Gude, Fritz; Brandt, Siegfried; Wolf, Elmar; and Obendorf, Johann, 4,014,954.

Obergfell, Allen R.: *See—*
Potucek, Frank R.; and Obergfell, Allen R., 4,014,488.

Obermeier, Rainer: *See—*
Geiger, Rolf; and Obermeier, Rainer, 4,014,861.

Oberst, E. Ernest, to Marlin Firearms Company, The. Safety marker for firearm. 4,014,124, Cl. 42-1.00Y.

Oberwelland, Klaus: *See—*
Klahn, Uwe; and Oberwelland, Klaus, 4,014,156.

Occidental Petroleum Corporation: *See—*
French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, 4,014,575.

Oda, Chikao; and Maruko, Morihisa, to Hitachi, Ltd. Horizontal type continuous pug mill for high viscous material. 4,014,525, Cl. 259-9.000.

Oda, Tatsuharu; Iwasaki, Yukio; Koyamd, Hideo; Maruyama, Shigeo; Matsubara, Takashi; Hozumi, Keiichi; and Kano, Hiroya, to Shin Meiwa Industry Co., Ltd. Automatic welding apparatus. 4,014,495, Cl. 228-7.000.

Odawara, Hiroyuki; Noguchi, Yoshio; and Ohno, Masaji, to Toray Industries, Inc. Separation of fructose from a mixture of sugars. 4,014,711, Cl. 127-46.00B.

Offermann, Richard A.; and Vorrier, Robert J., to Union Carbide Corporation. Polyethylene packaging film. 4,015,051, Cl. 428-523.000.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Frechin, Lucette, 4,014,757.

Ogawa, Akira: *See—*
Hinata, Masanao; Ohki, Masanaga; Takei, Hartuo; Sato, Akira; and Ogawa, Akira, 4,014,702.

Ogawa, Hisaharu: *See—*
Aihara, Mitsuo; Takada, Shigeho; and Ogawa, Hisaharu, 4,015,146.

Ogren, Axel E. Straightening apparatus. 4,014,196, Cl. 72-316.000.

Ohhinata, Ichiro: *See—*
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,015,143.

Ohkawa, Nobuyoshi, to Daieigiken, Inc. Device for wrapping sheets around food in rolled form and other food processing devices. 4,014,254, Cl. 99-450.600.

Ohki, Masanaga: *See—*
Hinata, Masanao; Ohki, Masanaga; Takei, Hartuo; Sato, Akira; and Ogawa, Akira, 4,014,702.

Ohloff, Gunther: *See—*
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Skorianetz, Werner; Renold, Walter; Ohloff, Gunther; and Schulte-Elte, Karl-Heinrich, 4,014,905.
Ohno, Masaji: *See—*
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Ohno, Nobuo: *See—*
Ume, Yoshitaka; Matsuo, Takashi; Itaya, Nobushige; and Ohno, Nobuo, 4,014,940.
Ohshima, Nobumasa; Kawarada, Hiroshi; Noma, Shinichi; and Tatsumichi, Toshio, to Matsushita Electric Industrial Co., Ltd. X-Y matrix type electroluminescent display panel. 4,015,166, Cl. 313-503.000.
Okamoto, Toshihide: *See—*
Suzuki, Yasuhiro; Okamoto, Toshihide; Noda, Yuzuru; and Kojima, Makoto, 4,014,832.
Okano, Shigeru: *See—*
Aoki, Yasuhiko; Suzuki, Hiroyuki; Akiyama, Hisao; and Okano, Shigeru, 4,014,895.
Okazaki, Kenichi. Hairbrush. 4,014,064, Cl. 15-159.00A.
Okubo, Yosiro: *See—*
Harima, Eiichi; and Okubo, Yosiro, 4,015,021.
Okuhara, Shinzi: *See—*
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,015,143.
Okumura, Masahide, to Hitachi, Ltd. D.C. high voltage power source with precise load current measurement. 4,015,191, Cl. 323-16.000.
Olin Corporation: *See—*
Kircher, Morton S.; and Engler, Maynard F., 4,014,775.
O'Neil, Eugene E.; Healy, Robert H.; and Eygabroad, Anneus E., to Dunham-Bush, Inc. Simplified balance valve steam trap. 4,014,362, Cl. 137-196.000.
Onishi, Kazuo: *See—*
Morinaga, Shigeki; and Onishi, Kazuo, 4,014,277.
Ontario Paper Company Limited, The: *See—*
Sexton, Ernest Arthur, 4,014,736.
Opcon, Inc.: *See—*
Wicklund, Joseph B., Jr., 4,015,117.
Original Hanau Quarzlampen GmbH: *See—*
Sturm, Walter H., 4,015,134.
Ortho Pharmaceutical Corporation: *See—*
Mallory, Robert A.; and Settepani, Joseph A., 4,014,999.
Osaka Gas Company, Ltd.: *See—*
Ueda, Kozo, 4,014,781.
Osborn, William P.; and Pearne, Frank S., to Aircraft Mechanics, Inc. Brick tie setting machine. 4,014,441, Cl. 214-6.00A.
Osburn, George E., to Hercules Incorporated. Fertilizer stick. 4,014,675, Cl. 71-28.000.
Oshier, Jack A. Method of making decorative articles. 4,014,088, Cl. 29-407.000.
Ossbahr, Carl Gilbert Richard. Modular article conveyor. 4,014,428, Cl. 198-345.000.
Ostermayer, Franz: *See—*
Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,014,920.
Osterreichische Heraklith Aktiengesellschaft: *See—*
Hattenberger, Adolf; Lind, Walter; and Strasser, Hubert, 4,014,967.
Osugi, Minoru; and Endo, Takako, to Mitsubishi Gas Chemical Company, Inc. Process for producing formaldehyde. 4,014,939, Cl. 260-603.00R.
O'Toole, Jerome M.; and Haskins, Martin L., to Wright Line Inc. Spring fastener. 4,014,438, Cl. 211-13.000.
Owen, Peter W.: *See—*
Dowd, William; and Owen, Peter W., 4,014,880.
Owen, Robert G. Apparatus for extracting metals from ore. 4,015,069, Cl. 13-9.00R.
Owens-Corning Fiberglas Corporation: *See—*
Costin, Darryl J., 4,014,692.
Deardurff, Lawrence R., 4,014,722.
Fargo, Harland E., 4,014,726.
McCombs, Frank Paul, 4,014,835.
Zadorozny, Peter, 4,015,102.
Owens-Illinois, Inc.: *See—*
Grier, John D.; and Taylor, Lynn J., 4,014,845.
Story, Augustus L., 4,014,833.
Owens, Robert J., to Du Pont de Nemours, E. I., and Company. Bromotrifluoromethane-containing fire extinguishing composition. 4,014,799, Cl. 252-8.000.
Ozawa, Kaoru: *See—*
Kasubuchi, Takeshi; Ozawa, Kaoru; and Makita, Tomoo, 4,015,267.
Paajanen, Paavo Antero; and Vaananen, Pentti Kauko Tapani, to A. Ahlstrom Osakeyhtio. Lighting fitting. 4,015,114, Cl. 240-47.000.
Page, Dennis, to Coal Industry (Patents) Limited. Determining the concentration of sulphur in coal. 4,015,124, Cl. 250-273.000.
Painter, Perry J., to Citizens and Southern National Bank, The. Concealed security transport system. 4,014,407, Cl. 186-1.00C.
Palmer, David A.: *See—*
Zimmerschied, Wilford J.; Palmer, David A.; and Bertolacini, Ralph J., 4,014,945.
Pameijer, Cornelis H., to Boston University, Trustees of. Method and apparatus for measuring and recording three-dimensional condylermovements of the mandible. 4,014,097, Cl. 32-20.000.
Paolinelli, Antonio: *See—*
Piccolo, Luigi; Paolinelli, Antonio; and Pellizzon, Tullio, 4,014,977.
Pappas, Peter G.: *See—*
Basalay, Robert J.; Pappas, Peter G.; and Edmisten, Walter C., 4,015,063.
Parent, Richard A., to Xerox Corporation. Multicolored xerographic transparency utilizing an aliphatic ester coating. 4,014,696, Cl. 96-1.400.
Park, Anthony John; and Sturt, Alan Charles, to British Petroleum Company Limited, The. Treatment of vinyl halide polymers. 4,015,065, Cl. 528-503.000.
Parker, James Brown: *See—*
Morman, James Forrester; and Parker, James Brown, 4,014,349.
Parnes, Marvin J., to Universal Oil Products Company. Recombining of dissociated hydrogen and oxygen. 4,014,984, Cl. 423-580.000.
Parquet, Donald James, to J. I. Case Company. Accumulator warning system. 4,014,213, Cl. 73-290.00R.
Pasquarello, Edward J. Shampoo device. 4,014,054, Cl. 4-159.000.
Passal, Frank, to M & T Chemicals Inc. Bright acid zinc plating. 4,014,761, Cl. 204-55.00R.
Passedouet, Andre Henri; and Pipon, Robert, to Rhone-Poulenc S.A. Certain quaternary ammonium salts used to control gram-negative bacteria. 4,015,013, Cl. 424-324.000.
Paton, Robert Michael: *See—*
Crosby, John; Rennie, Robert Allan Campbell; Tanner, John; and Paton, Robert Michael, 4,014,893.
Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Tube forming device. 4,014,734, Cl. 156-459.000.
Patton, John T., Jr.: *See—*
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T., Jr.; and Murphy, John R., 4,014,846.
Paul Anderson Industrier AB: *See—*
Naslund, Soren; and Bohm, Gosta Martin, 4,014,266.
Paul, Kenneth G.: *See—*
Johnson, Francis; Paul, Kenneth G.; and Favara, Duccio, 4,014,919.
Paull, Peter L.; and Caffrey, James M., Jr., to Texaco Development Corporation. Combined process for upgrading spent alkylation acid and reducing noxious gas content of waste gaseous streams. 4,014,982, Cl. 423-528.000.
Pawelczyk, Werner, to Hermann Berstorff Maschinenbau GmbH. Synthetic plastics film manufacturing plant including a multiple-roll calender. 4,014,636, Cl. 425-224.000.
Payne, Rex E.; and Aegerter, Henry F., Jr., to Hoover Company, The. Brush mounting and torsion spring support for powered nozzle. 4,014,068, Cl. 15-355.000.
Pearce, Richard Elmer. Trash bagger. 4,014,157, Cl. 53-35.000.
Pearne, Frank S.: *See—*
Osborn, William P.; and Pearne, Frank S., 4,014,441.
Pearson, Alan: *See—*
Haleen, Leonard W.; and Pearson, Alan, 4,014,985.
Pearson, Bernard A., to Smith-Williston, Inc. Rock drill bit insert retaining sleeve assembly. 4,014,395, Cl. 175-410.000.
Pearson, David Henry: *See—*
Andrews, John Frederick Collett; Budzinski, Edward Stanislaw; and Pearson, David Henry, 4,015,138.
Pearson, Russell O., to TRW Inc. Dynamic positioning system for a vessel containing an ocean thermal energy conversion system. 4,014,279, Cl. 114-270.000.
Peche, Gerhard; and Lange, Gerhard, to Siemens Aktiengesellschaft. Two path voltage arrester. 4,015,172, Cl. 361-129.000.
Pedersen, David William. Apparatus and method for collecting solar energy at an upright surface. 4,014,313, Cl. 126-270.000.
Peet, Robert L., to Bliss & Laughlin Ind., Inc. Microelectronic circuit case. 4,015,071, Cl. 174-52.00S.
Pekau, Dietlind; and Storck, Eckhard, to Siemens Aktiengesellschaft. Process for recording low-frequency wide-band signals on a thermoplastic storage medium. 4,015,248, Cl. 340-173.0TP.
Pellerin, Roger A.: *See—*
Millier, William F.; Rehkugler, Gerald E.; Pellerin, Roger A.; and Throop, James A., 4,014,440.
Pellizzon, Tullio: *See—*
Piccolo, Luigi; Paolinelli, Antonio; and Pellizzon, Tullio, 4,014,977.
Peltzer & Ehlers: *See—*
Koch, Friedrich-Karl; and Schneiders, Hugo, 4,014,203.
Penick & Ford, Limited: *See—*
Black, William C., 4,014,743.
Perez, Donald E.: *See—*
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Perkin-Elmer Corporation, The: *See—*
Atwood, John G.; Marshall, Hamilton W., Jr.; Demey, Charles F., II; and Kalston, Wilson P., 4,014,612.
Perkins, Rodney C. Method for making a tympanic membrane prosthesis. 4,014,971, Cl. 264-219.000.
Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. Novel crotonanilides. 4,014,679, Cl. 71-118.000.
Perry, Frederick G.: *See—*
Senor, Ronald E.; and Perry, Frederick G., 4,015,229.
Pershin, Sergei Vladimirovich: *See—*
Dremin, Anatoly Nikolaevich; Breusov, Oleg Nikolaevich; Bavina, Tamara Vasilievna; and Pershin, Sergei Vladimirovich, 4,014,979.
Pesson, Marcel; and Techer, Henri, to Laboratoire Roger Bellon. 1-Aryl-2-oxo-2,4,5,6,7,7a-hexahydro-indoles, salts, pharmaceutical compositions and methods of use. 4,015,002, Cl. 424-248.580.

Peter, Heinrich; Muller, Beat; Sibral, Walter; and Bickel, Hans, to Ciba-Geigy Corporation. Process for the manufacture of 3-substituted thiomethyl-7-amino-2-cephem-4-carboxylic acid compound. 4,014,874, Cl. 260-243.00C.

Petersen, Carl Mogens, III: *See*—
Gavagan, James A.; and Petersen, Carl Mogens, III, 4,015,094.

Peterson, Jerry D.; and Knief, Gerald L., to Ritchie Industries, Inc. Valve. 4,014,365, Cl. 137-549.000.

Peterson, Richard W.: *See*—
Landry, Robert Joseph; Bostrom, Robert G.; and Peterson, Richard W., 4,015,130.

Pettit, Lewis A. Back scratching and/or scrubbing device. 4,014,051, Cl. 4-158.000.

Peyrelongue, Jean-Pierre: *See*—
Andro, Jean; and Peyrelongue, Jean-Pierre, 4,014,671.

Pfeiffer, Wilfried: *See*—
Buschbeck, Jurgen; and Pfeiffer, Wilfried, 4,015,132.

Pfizer Inc.: *See*—
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Nubel, Robert C., 4,014,742.
Richardson, Kenneth, 4,014,937.
Welch, Willard M., Jr., 4,014,890.

Pflugmacher, Ingo: *See*—
Woditsch, Peter; Hund, Franz; Buxbaum, Gunter; Hahnkamm, Volker; and Pflugmacher, Ingo, 4,014,710.

Pharriss, Bruce B.; Erickson, Ross R.; and Tillson, Stephen A., to Alza Corporation. Method for treating hypermenorrhea with uterine therapeutic system. 4,014,988, Cl. 424-14.000.

Phillips Petroleum Company: *See*—
Bailey, Daniel F., 4,014,394.
Barber, Franklin T., 4,014,667.
Brown, Webster W., Jr., 4,014,953.
Hogan, John P.; Nasser, Benny E.; and Delap, Joseph A., 4,014,816.
Myers, John W., 4,014,948.

Phillot, Charles; and Unterweger, Heinz, to Sprecher & Schuh AG. Reference value transmitter for a phase clipping control for starting a squirrel cage-asynchronous motor. 4,015,178, Cl. 318-227.000.

Phosphate Co-operative Company of Australia Ltd., The: *See*—
Majewski, Edward Adam, 4,014,682.

Piazza, Charles J. Spring bracket for lawn mower grass catcher. 4,014,159, Cl. 56-202.000.

Picciolo, Grace L.: *See*—
United States of America, National Aeronautics and Space Administration; Chappelle, Emmett W.; Picciolo, Grace L.; Vellend, Hillar; Tuttle, Stephanie A.; Barza, Michael J.; and Weinstein, Louis, 4,014,745.

Piccolo, Luigi; Paolinelli, Antonio; and Pellizzon, Tullio, to Societa' Italiana Resine S.I.R. S.p.A. Process for the hydrolysis of titanium sulphate solutions. 4,014,977, Cl. 423-85.000.

Pichler, Ludwig: *See*—
Schromm, Kurt; Mentrup, Anton; Renth, Ernst Otto; Pichler, Ludwig; and Traunecker, Werner, 4,015,011.

Pickel, Hajo, to ITT Industries, Inc. Adjusting device for hydraulic working pistons. 4,014,415, Cl. 188-196.00D.

Picker Corporation: *See*—
Manring, John Michael, 4,015,129.

Picker Electronics, Inc.: *See*—
Meyer, Edward P.; and Wright, William L., 4,014,207.

Pickwell, Robert J.: *See*—
Ranney, Maurice W.; and Pickwell, Robert J., 4,015,044.
Ranney, Maurice W.; and Pickwell, Robert J., 4,015,047.

Pierce, Stanley L., Jr., to Ford Motor Company. Multiple ratio hydrokinetic split torque transmission. 4,014,223, Cl. 74-688.000.

Pieverling, Klaus V.; Klemt, Gerhard; Maier, Bruno; and Leypold, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for the digitalization of an angle or rotation. 4,015,251, Cl. 340-347.0SY.

Pilkington Brothers Limited: *See*—
Yale, Brian, 4,014,705.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, 4,014,758.

Pinkston, Melvin D.; and Hartenstein, Robert L., to Dayco Corporation. Printing blanket and method of making same. 4,015,046, Cl. 428-422.000.

Pipon, Robert: *See*—
Passedouet, Andre Henri; and Pipon, Robert, 4,015,013.

Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of 4,4'-diphenylmethane diisocyanate and a mixture of diisocyanates and polyisocyanates. 4,014,914, Cl. 260-453.0PH.

Pitney-Bowes, Inc.: *See*—
Kleid, Robert E.; Illk, Donald J.; and Keyt, Ferris Gene, 4,014,535.
McDonough, William F.; Montlick, James A.; and Bernard, Richard A., 4,015,131.

Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, to International Flavors & Fragrances Inc. Novel tobacco flavoring and aroma compositions and tobaccos containing alpha-substituted acetaldehyde. 4,014,351, Cl. 131-17.00R.

Pittman, Robert B., to Industrial Electronic Hardware Corporation. Tube socket and method of using same. 4,014,601, Cl. 339-275.00B.

Pitts, Dallas L., to Pitts Drive, Inc. Speed differential planetary gear train. 4,014,224, Cl. 74-805.000.

Pitts Drive, Inc.: *See*—
Pitts, Dallas L., 4,014,224.

Pizzini, Louis C.: *See*—
Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T., Jr.; and Murphy, John R., 4,014,846.

Platt Saco Lowell Corporation: *See*—
Cox, William L., 4,014,161.

Platz, Rolf: *See*—
Fuchs, Werner; Platz, Rolf; Rieber, Norbert; and Scholz, Andreas, 4,014,753.

Plisky, John J.: *See*—
Harbison, William H.; and Plisky, John J., 4,014,066.

Plom, Jean-Paul: *See*—
Plom, Paul; and Plom, Jean-Paul, 4,014,376.

Plom, Paul; and Plom, Jean-Paul. Window blinds. 4,014,376, Cl. 160-172.000.

Plumer, Roy D., to United States of America, Army. Caseless projectile. 4,014,263, Cl. 102-38.000.

Pogorsky, Viktor Konstantinovich: *See*—
Puzhailo, Leonid Petrovich; Polischuk, Vitaly Petrovich; and Pogorsky, Viktor Konstantinovich, 4,014,529.

Polak, Lev Solomonovich: *See*—
Volodin, Nikolai Lvovich; Polak, Lev Solomonovich; Endjuskin, Petr Nikolaevich; Levenzon, Rafail Izrailevich; Krugly, Samuil Markovich; and Dyatlov, Viktor Trofimovich, 4,014,947.

Polaroid Corporation: *See*—
Merz, David S., 4,014,120.

Polischuk, Vitaly Petrovich: *See*—
Puzhailo, Leonid Petrovich; Polischuk, Vitaly Petrovich; and Pogorsky, Viktor Konstantinovich, 4,014,529.

Pollmeier, Werner, to Nixdorf Computer AG. Semiconductor switching circuit with transistor switching power loss reduction means. 4,015,185, Cl. 321-44.000.

Polysar Limited: *See*—
Xanthopoulo, Valentino George, 4,014,843.

Polysius AG: *See*—
Helming, Bernd, 4,014,642.

Pontefract, Robert A., to Jerguson Gaga and Valve Company. Liquid level indicator. 4,014,214, Cl. 73-330.000.

Popov, Vitaly Fedorovich. Ejector mixer for gases and/or liquids. 4,014,961, Cl. 261-76.000.

Pops, Horace: *See*—
Cabo, Amado; and Pops, Horace, 4,014,716.

Porter, William D.: *See*—
Fink, Roger H.; and Porter, William D., 4,014,085.

Potma, Theodorus Gerhardus: *See*—
Gijzen, Wilhelmus Adrianus Henricus; and Potma, Theodorus Gerhardus, 4,014,425.

Potter, Clyde E.; and Richter, George N., to Texaco Inc. Carbon separation. 4,014,786, Cl. 210-22.00R.

Potucek, Frank R.; and Obergfell, Allen R., to Duo-Fast Corporation. Fastener feed apparatus and method. 4,014,488, Cl. 226-6.000.

Powell, James E., to Shell Oil Company. Control of insects by nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)methyl aldehydes and ketones. 4,015,001, Cl. 424-246.000.

PPG Industries, Inc.: *See*—
Rinehart, Dale W., 4,015,045.
Rowley, James R.; and Majesky, Paul D., 4,014,435.

Pratt, Arnold T. Electronic control unit for intrusion system. 4,015,256, Cl. 340-409.000.

Prechtel, Klaus, to J. M. Voith GmbH. Sifting drum paper machine wherein the diluent water is controlled. 4,014,738, Cl. 162-258.000.

Pressman, Gerald L.: *See*—
Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., 4,014,694.

Preston, John M., to General Electric Company. Solder cleaning and coating composition. 4,014,715, Cl. 148-6.170.

Priese, Werner K.; and Hayes, Wayne David, to Hills-McCanna Company. High pressure diaphragm valve. 4,014,514, Cl. 251-331.000.

Probst, Robert L.; and Fairand, Barry P., to Federal-Mogul Corporation. Process for making metal powder using a laser. 4,014,964, Cl. 264-10.000.

Procter & Gamble Company, The: *See*—
Mast, John George, Jr.; and Green, Paul James, 4,014,616.

Prodev Limited: *See*—
Wolfe, Maynard Frank, 4,014,493.

Production Data Inc.: *See*—
Epling, Karol E., 4,015,194.

Prohaska, Hans: *See*—
Jurowski, Willi; Kohler, Alfred; Prohaska, Hans; and Schrade, Eugen, 4,014,061.

Protecon B.V.: *See*—
van Bergen, Theodorus M., 4,014,075.

Protsenko, Valentin Prokofievich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.

Providence Pile Fabric Corporation: *See*—
Bialek, Stephen M., 4,014,489.

PSC Technology, Inc.: *See*—
Christopherson, Rodger L.; and Sorokin, George J., 4,014,112.

PTI-DOLCO: *See*—
Dillon, James C.; and Robins, Milton, 4,014,192.

Pullen, Charles E. Strap holder assembly. 4,014,240, Cl. 84-327.000.

Purcell, Kenneth G. Building structural system. 4,014,143, Cl. 52-90.000.

Pusch, Gunter; and Gedenk, Rudolf, to Deutsche Texaco Aktiengesellschaft. Ignition mixture for initiating underground in-situ combustion. 4,014,721, Cl. 149-108.600.

Pusztaszeri, Stephen F. Purification of 2-pyrrolidone. 4,014,900, Cl. 260-326.5FN.

Puzhailo, Leonid Petrovich; Polischuk, Vitaly Petrovich; and Pogorsky, Viktor Konstantinovich. Device for vacuum-refining of molten metal. 4,014,529, Cl. 266-210.000.

Quaker Oats Company, The: *See—*
Burkwall, Morris P., Jr.; Engstrom, Carl D.; and Snyder, Robert F., 4,015,026.
Juliano, Angelo L.; and Miller, Aaron, 4,014,995.

Quantel Limited: *See—*
Stalley, Anthony Donald; and Bishop, Alan Martin, 4,014,598.

Quinn, Governor V.: *See—*
Jordan, Ulice A.; and Quinn, Governor V., 4,014,114.

R F L Industries, Inc.: *See—*
Kaufman, Barry M., 4,015,220.

Raab, Ronald Buxton: *See—*
Wells, David Lee; and Raab, Ronald Buxton, 4,014,150.

Rabiner, Lawrence Richard: *See—*
Dubnowski, John Joseph; Rabiner, Lawrence Richard; and Schafer, Ronald William, 4,015,088.

Rabischong, Pierre: *See—*
Lagasse, Jean; Clot, Jean; Falipou, Jean; Loubieres, Andre; Rabischong, Pierre; Richard, Jean-Pierre; and Bui, Ai, 4,014,217.

Raimer, Juergen, to Siemens Aktiengesellschaft. Method and apparatus for control of central spacing of track-operated vehicles. 4,014,503, Cl. 246-34.00R.

Raines, Kenneth; and Burke, George K., to Burron Medical Products, Inc. Intravenous injection apparatus and needle adapter with filter and method of making same. 4,014,797, Cl. 210-446.000.

Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, to Vereinigte Edelstahlwerke AG. Process and arrangement for vaporizing of liquids. 4,014,752, Cl. 202-185.00A.

Ralston, Wilson P.: *See—*
Atwood, John G.; Marshall, Hamilton W., Jr.; Demey, Charles F., II; and Ralston, Wilson P., 4,014,612.

Ramlow, Gerhard G.; Pizzini, Louis C.; Patton, John T., Jr.; and Murphy, John R., to BASF Wyandotte Corporation. Low-viscous, stable polymer dispersions and polyurethanes prepared therefrom. 4,014,846, Cl. 260-33.20R.

Rancurel, Alain: *See—*
Gazave, Jean-Maurice; Rancurel, Alain; and Grenier, Georges, 4,015,017.

Randell, Donald Richard; Holt, Brian; and Virgin, Alan Geoffrey, to Ciba-Geigy Corporation. Substituted piperidin-4-ols. 4,014,887, Cl. 260-293.840.

Rank Organisation Limited, The: *See—*
Demaine, David George Anthony; Archer, John David; and Fisher, Richard Lawrence, 4,015,235.

Ranney, Maurice W.; and Pickwell, Robert J., to Union Carbide Corporation. Process of bonding polyurethane-sealants and caulks. 4,015,044, Cl. 428-419.000.

Ranney, Maurice W.; and Pickwell, Robert J., to Union Carbide Corporation. Polyurethane sealant and caulk systems. 4,015,047, Cl. 428-425.000.

Rao, Tadikonda Narasimha; and Toumani, Rouben, to Bell Telephone Laboratories, Incorporated. Telephone ringing generators. 4,015,091, Cl. 179-84.00R.

Rappleyea, Frederick A., to Kendall Company, The. Inflation device. 4,014,048, Cl. 2-413.000.

Rausch, Richard E., to UOP Inc. Hydroprocessing of hydrocarbons. 4,014,783, Cl. 208-255.000.

Rausing, Hans A., to AB Ziristor. Apparatus for filling and sealing preformed packaging containers under aseptic conditions. 4,014,158, Cl. 53-167.000.

Rausing, Ruben A. Bottle-shaped containers of the one-way type and a method for the manufacture of the same. 4,014,724, Cl. 156-86.000.

Ravasio, Piercarlo: *See—*
Mercurio, Luigi; and Ravasio, Piercarlo, 4,015,245.

Raymond Lee Organization, Inc., The: *See—*
Bunke, Edward J., 4,014,063.
Davis, Charles W., 4,014,285.
Karamarkovich, John, 4,014,226.
Spotteck, Frederick P., 4,014,100.

Raytheon Company: *See—*
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RCA Corporation: *See—*
Ham, William Edward, 4,015,279.
Sandercock, John Riddle, 4,014,614.
Shidlovsky, Igal, 4,014,813.
Woods, Murray Henderson; and Williams, Richard, 4,014,772.

Read, Brian, to Fawcett Engineering Limited. Differential pressure indicators. 4,014,284, Cl. 116-114.0PV.

Reader, Arthur J. Arena aisle railing. 4,014,523, Cl. 256-59.000.

Reba, Imants; and Hogland, Gerald Hugh, to Crown Zellerbach Corporation. Web threading system. 4,014,487, Cl. 226-5.000.

Rebhan, Herbert J.: *See—*
Glabe, Elmer F.; and Rebhan, Herbert J., 4,015,018.

Reen, Orville W., to Allegheny Ludlum Industries, Inc. Prealloyed stainless steel powder for liquid phase sintering. 4,014,680, Cl. 75-.5BA.

Regal China Corporation: *See—*
Greenberg, Jerome S., 4,014,448.

Regie Nationale des Usines Renault: *See—*
Boudeville, Jean-Claude, 4,015,236.

Rehder, Ludwig: *See—*
Fischer, Ernst; Lorenz, Roland; and Rehder, Ludwig, 4,015,164.

Rehkugler, Gerald E.: *See—*
Millier, William F.; Rehkugler, Gerald E.; Pellerin, Roger A.; and Throop, James A., 4,014,440.

Reichert, Robert J. Decorator heel/shoe combination. 4,014,115, Cl. 36-137.000.

Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for hydrophobizing silicas and silicates with organosilanes. 4,015,031, Cl. 427-213.000.

Reitel, Christian: *See—*
Fischer, Adolf, deceased; Rohr, Wolfgang; and Reitel, Christian, 4,014,904.

Reiter, Herbert, to Siemens Aktiengesellschaft. Apparatus for comparing voltages. 4,015,141, Cl. 307-235.00N.

Rembaum, Alan, to California Institute of Technology. Insoluble polyelectrolyte and ion-exchange hollow fiber impregnated therewith. 4,014,798, Cl. 210-500.00M.

Renner, Alfred, to Ciba-Geigy AG. Process for the manufacture of polyethers containing ionic bonds. 4,014,955, Cl. 260-831.000.

Rennie, Robert Allan Campbell: *See—*
Crosby, John; Rennie, Robert Allan Campbell; Tanner, John; and Paton, Robert Michael, 4,014,893.

Renold, Walter: *See—*
Skorianetz, Werner; Renold, Walter; Ohloff, Gunther; and Schulte-Elte, Karl-Heinrich, 4,014,905.

Renth, Ernst Otto: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst Otto; Pichler, Ludwig; and Traunecker, Werner, 4,015,011.

Rentz, Robert I. Method of molding a multi-colored disc. 4,014,972, Cl. 264-245.000.

Republic Tool & Manufacturing Corporation: *See—*
Hadley, John R.; LeBrun, Michel A., Jr.; McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,014,449.

Research Corporation: *See—*
Brownlee, Robert R.; Tyers, G. Frank O.; and Volz, Carl, Sr., 4,014,346.
Sigelmann, Rubens A., 4,014,650.

Research Enterprises Corporation: *See—*
Waldron, Robert D., 4,014,706.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Anti-pollution spark plug. 4,015,161, Cl. 313-143.000.

Rhinehart, Paul E. Vehicle recycling process. 4,014,681, Cl. 75-12.000.

Rho Sigma Corporation: *See—*
Bahm, Raymond J., 4,015,116.

Rhodes, Alex: *See—*
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Rhone-Poulenc S.A.: *See—*
Passedouet, Andre Henri; and Pipon, Robert, 4,015,013.

Richard, Jean-Pierre: *See—*
Lagasse, Jean; Clot, Jean; Falipou, Jean; Loubieres, Andre; Rabischong, Pierre; Richard, Jean-Pierre; and Bui, Ai, 4,014,217.

Richards, George Benton. Audiometric apparatus. 4,014,320, Cl. 128-2.00Z.

Richards Manufacturing Company, Inc.: *See—*
Treace, Harry T., 4,014,337.

Richards, William; and Grolman, Bernard, to American Optical Corporation. Artificial intraocular lens and supporting system therefor. 4,014,049, Cl. 3-13.000.

Richardson, Kenneth, to Pfizer Inc. 3,4-And 3,5-dialkoxyphenethylamines. 4,014,937, Cl. 260-570.80R.

Richter, George N.: *See—*
Potter, Clyde E.; and Richter, George N., 4,014,786.

Richter, Gunther, to Veba-Chemie AG. Method of refining pyromellitic acid dianhydride. 4,014,755, Cl. 203-73.000.

Ricoh Co., Ltd.: *See—*
Takahashi, Akira; and Furukawa, Masamichi, 4,015,274.

Riddle, Stanley T.; and Vair, Gary G., to International Business Machines Corporation. Apparatus and method for controlling magnetic head surface formation. 4,014,141, Cl. 51-165.00R.

Ridley, Richard D.: *See—*
French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, 4,014,575.

Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,014,996.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,014,998.

Rieber, Norbert: *See—*
Fuchs, Werner; Platz, Rolf; Rieber, Norbert; and Scholz, Andreas, 4,014,753.

Rieger, Hans Wolfhart: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 4,014,417.

Riese, Hans-Walter, to Fichtel & Sachs A.G. Braked automotive friction clutch. 4,014,420, Cl. 192-13.00R.

Riess, Gerard: *See—*
Vidal, Alain; Riess, Gerard; and Donnet, Jean-Baptiste, 4,014,844.

Riester, C. George. Waste disposal structure and system. 4,014,668, Cl. 55-90.000.

Rifkin, Morton S., to Diston Industries, Inc. Panel attached guides for tub enclosures and the like. 4,014,070, Cl. 16-90.000.

Riker Laboratories, Inc.: *See—*
Gerster, John F., 4,014,877.

Riko, Yasuhiro; and Miura, Kenzo, to Matsushita Electric Industrial Co., Ltd. Electromagnetic transducer. 4,015,227, Cl. 335-231.000.

Rinehart, Dale W., to PPG Industries, Inc. Chemical strengthening of glass. 4,015,045, Cl. 428-410.000.

Rines, Carol M. Variable bottom-edge margin indicator and method for typewriter paper and the like. 4,014,427, Cl. 197-189.000.

Rishavy, Edward A.; and Currie, James H., to General Motors Corporation. Rotary engine combustion control arrangement. 4,014,297, Cl. 123-8.090.

Ritchie Industries, Inc.: *See*—
Peterson, Jerry D.; and Knief, Gerald L., 4,014,365.

Ritter, John C. Paint can pour spout. 4,014,465, Cl. 222-563.000.

Rivolo, Pier Franco, to Fiat Societa per Azioni. Injection pumps for diesel engines. 4,014,304, Cl. 123-139.00E.

Robert Bosch G.m.b.H.: *See*—
Bosch, Paul, 4,014,250.

Roberts, Allen. Fish hook extraction tool. 4,014,130, Cl. 43-53.500.

Robertson, Joseph D. Scrap recovery and feed system. 4,014,462, Cl. 222-136.000.

Robinet, Jules P.; and Tamasovics, John. Interchangeable sign. 4,014,118, Cl. 40-143.000.

Robins, Milton: *See*—
Dillon, James C.; and Robins, Milton, 4,014,192.

Robinson, Ronald L., to Go-Jo Industries, Inc. Container closure. 4,014,459, Cl. 220-380.000.

Rochester General Hospital, The: *See*—
Welch, Joseph D.; Doyle, Barbara J.; Weintraub, Harvey A.; and Cerulli, Ludovico, 4,014,329.

Rochow, Kenneth H.: *See*—
Grace, Richard C.; and Rochow, Kenneth H., 4,014,475.

Rockwell International Corporation: *See*—
Bake, Earl A.; and Schoeneweis, E. Frederick, 4,014,513.
Moore, John F.; and Coate, Forrest M., 4,014,208.

Rodieck, Chester C. Automatic anti-siphon valve. 4,014,361, Cl. 137-122.000.

Roger, Jean Claude: *See*—
Schaffner, Karl; Meisels, Alex; Roger, Jean Claude; and Weis, Claus D., 4,015,007.

Rohlf, Vincent E.; Kratz, Karl R.; and Hucek, Richard F., to Calumet Co., Inc., The. Liquid manure system. 4,014,271, Cl. 111-7.000.

Rohm and Haas Company: *See*—
Chancler, Francis X.; and Moser, Vincent J., 4,014,645.

Rohr, Wolfgang: *See*—
Fischer, Adolf, deceased; Rohr, Wolfgang; and Reitel, Christian, 4,014,904.

Roller, Robert S.; Holcomb, Richard H.; and Danko, George K., to General Electric Company. Iodine lamp with molybdenum parts. 4,015,157, Cl. 313-25.000.

Roller, Robert S.; Holcomb, Richard H.; and Danko, George K., to General Electric Company. Bromine lamp with molybdenum parts. 4,015,158, Cl. 313-25.000.

Rollins, Dallas W.: *See*—
Grott, Charles N.; and Rollins, Dallas W., 4,014,578.

Romanski, Eric R.; Horn, J. Drew; and Dutt, William H., to Albany International Corporation. Novel high temperature resistant fabrics. 4,015,038, Cl. 428-255.000.

Romeas, Rene, to Thomson-Brandt. Method of recording television signals on a data carrier and a recording obtained by said method. 4,015,285, Cl. 358-4.000.

Romine, Hugh E., to Continental Oil Company. Lubricant additive. 4,014,803, Cl. 252-32.70R.

Rommel, Klaus, to Zellweger, Ltd. Cell for measurement of the electrical conductivity of liquids. 4,015,199, Cl. 324-30.00B.

Rosenbaum, Georges: *See*—
Vanlerberghe, Guy; and Rosenbaum, Georges, 4,014,990.

Rosenberg, Peretz. Fluid-flow control devices particularly useful as dripper nozzles in trickle irrigation. 4,014,473, Cl. 239-542.000.

Rosenkranz, Hans Jurgen; Rudolph, Hans; and Haus, Artur, to Bayer Aktiengesellschaft. Highly reactive resin compositions hardenable by UV-light. 4,014,771, Cl. 204-159.230.

Rosier, Laurence Lee: *See*—
Hu, Hung Liang; and Rosier, Laurence Lee, 4,015,249.

Ross, Frederick W. Stabilized piston-cylinder impact device. 4,014,392, Cl. 173-118.000.

Ross, Lawrence James: *See*—
Garber, Murray; Ross, Lawrence James; and Stepek, Walter Joseph, 4,014,896.

Roth, Arthur; and Schmidt, Otto, to Siemens Aktiengesellschaft. Method for the electrolytic polishing of the inside surface hollow niobium bodies. 4,014,765, Cl. 204-129.430.

Roth, Leo. Measuring device. 4,014,103, Cl. 33-141.00R.

Rothfuss, Robert G., to Senco Products, Inc. Surgical staple. 4,014,492, Cl. 227-19.000.

Rothmans of Pall Mall Canada Limited: *See*—
Jamieson, Patrick J., 4,014,352.

Rotkerl, Otto: *See*—
Bandoch, Rudolf; Marecek, Miroslav; and Rotkerl, Otto, 4,014,187.

Roussel-UCLAF: *See*—
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Perronnet, Jacques; and Girault, Pierre, 4,014,679.

Rowlands, Geoffrey John: *See*—
Cleaver, Brian; and Rowlands, Geoffrey John, 4,015,054.

Rowley, James R.; and Majesky, Paul D., to PPG Industries, Inc. Collapsible rack for shipping and/or storing glass sheets. 4,014,435, Cl. 206-386.000.

Roy, Walter J.: *See*—
Scott, Thomas W.; and Roy, Walter J., 4,014,062.

Rozin, Viktor Sergeevich: *See*—
Kirillov, Ivan Ivanovich; Agishev, Alexandr Petrovich; Ameljushkin, Vladimir Nikolaevich; Bogdanovich, Sabir Yakubovich; Guseinov, Chingiz Saibovich; Medvedev, Valentin Valentinovich; Faddeev, Igor Petrovich; and Rozin, Viktor Sergeevich, 4,014,674.

RPC Corporation: *See*—
Whiteman, Donald R.; and Guthrie, Dale H., 4,014,447.

Rubinstein, Walter M. Photo-electric object detection system. 4,015,122, Cl. 250-221.000.

Ruder, Joachim, to Demag Aktiengesellschaft. Mount for heavy servo mechanisms. 4,014,399, Cl. 180-8.00C.

Rudolph, Hans: *See*—
Rosenkranz, Hans Jurgen; Rudolph, Hans; and Haus, Artur, 4,014,771.

Rudolph, Paul: *See*—
Kupfer, Hans; Lange, Paul; and Rudolph, Paul, 4,014,664.

Ruell, Hartwig, to Siemens Aktiengesellschaft. Identification card having a hologram superimposed on printed data. 4,014,602, Cl. 350-3.500.

Ruggles, Charles F.; and Baruch, Stenton A. Knot tying assistance contrivance. 4,014,570, Cl. 289-17.000.

Rumble, Clive St. John; Rumble, Richard Roy; and Henderson, Patrick Joseph. Display units more particularly for cassettes, tape cartridges and the like. 4,014,437, Cl. 211-4.000.

Rumble, Richard Roy: *See*—
Rumble, Clive St. John; Rumble, Richard Roy; and Henderson, Patrick Joseph, 4,014,437.

Rumfield, Robert D., to Celanese Coatings & Specialties Company. Acrylate or methacrylate modified alkyd resins and epoxy esters. 4,014,830, Cl. 260-22.0CB.

Ruseff, Walter Zdzislaw; and Tribley, Gilbert, to Caterpillar Tractor Co. Supercharged three-section pump. 4,014,628, Cl. 417-203.000.

Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning process. 4,014,380, Cl. 165-2.000.

Rusk, Gerald R.; and Koch, Robert E., to Freeman Supply Company, The. Pattern plates and method of making same. 4,014,090, Cl. 29-527.400.

Russell, James T., to Jacobs, Eli S. Digital color television system. 4,015,286, Cl. 358-13.000.

Ryan, Hollis F.: *See*—
Swonger, Claron W.; Ryan, Hollis F.; Stock, Robert M.; and Vossler, Charles M., 4,015,240.

Ryobi, Ltd.: *See*—
Morishita, Yasomatsu, 4,014,422.

Ryser, Gottlieb: *See*—
Huppi, Gerhard; De Silva, Wijitha; and Ryser, Gottlieb, 4,014,678.

Sachs, Isaac. Cable hooking device. 4,014,504, Cl. 248-61.000.

Sacht, Hans-Joachim: *See*—
Lohmann, Ernst; and Sacht, Hans-Joachim, 4,014,396.

Sahasrabudhe, Arun P.: *See*—
Matty, Thomas C.; and Sahasrabudhe, Arun P., 4,015,082.

Saint-Gobain Industries: *See*—
Loubet, Jacques Charles, 4,014,733.

Saito, Akio, to Show Seitai Kogyo Kaisha Ltd. Method of manufacturing bags. 4,014,252, Cl. 93-35.00R.

Saito, Yasuhiro: *See*—
Hasegawa, Ryozo; and Saito, Yasuhiro, 4,014,167.

Saitou, Kikuo: *See*—
Satou, Itsuzou; and Saitou, Kikuo, 4,015,079.

Sakamoto, Minoru. Combined golf ball tether and anchor structure. 4,014,553, Cl. 273-200.00R.

Sakanoue, Seiki: *See*—
Fujita, Shinsaku; Maekawa, Yukio; Sano, Kazuya; and Sakanoue, Seiki, 4,014,700.

Salter, Frederick H., to United States of America, Commerce. Fish egg incubator. 4,014,293, Cl. 119-3.000.

Saltzman, William H., to Intellectual Property Development Corporation. Chemical process. 4,014,908, Cl. 260-397.100.

Samander, Asib S.: *See*—
Beaty, Thomas, Jr.; and Samander, Asib S., 4,014,430.

Samcoe Holding Corporation: *See*—
Bryan, Clifford Chandler, 4,014,081.

Samuels, Philip Rufus, to General Electric Company Limited, The. Circuits for operating electric discharge lamps. 4,015,167, Cl. 315-99.000.

Samuels, Wiley H.; and Murray, James M., to Samuels, Wiley H. Slingshot-action fishing rod. 4,014,126, Cl. 43-19.000.

Samuelson, Harold Ray: *See*—
Etcheverry, Fred; and Samuelson, Harold Ray, 4,015,262.

Sanada, Noriaki: *See*—
Yazaki, Mutsunobu; Sanada, Noriaki; and Taguchi, Tetsuya, 4,015,277.

Sanchez Enterprises, Inc.: *See*—
Berges, Timothy J., 4,014,458.

Sanchez, Louis A., to Itek Corporation. Dual channel pulse width detector having delay and D.C. offset means therein. 4,015,211, Cl. 329-106.000.

Sanda, Masaru: *See*—
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Sandercock, John Riddle, to RCA Corporation. High resolution, high contrast Fabry-Perot spectrometer. 4,014,614, Cl. 356-106.00S.

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Ebihara, Norio; and Tatami, Mitsushige, 4,015,288.
Hamada, Osamu, 4,015,213.
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Kitada, Takaharu, 4,015,090.
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Matsushita, Takeshi; and Mamine, Takayoshi, 4,015,280.
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Sorokin, George J.: *See*—
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Sosnowski, Stanislaw Jan Antoni: *See*—
Skinner, Robert Thomas John; and Sosnowski, Stanislaw Jan Antoni, 4,014,305.

Soto, Enrique. Machine for processing drapery material. 4,014,276, Cl. 112-214.000.

Southard, James S., to C.G. Conn, Ltd. Tone signal waveform control network for musical instrument keying system. 4,014,238, Cl. 84-1.130.

SPA-Societa Prodotti Antibiotici S.p.A.: *See*—
Magnaghi, Sergio; Felci, Eustorgio; and Ferrari, Rodolfo, 4,014,994.

Spangler, Larry D.: *See*—
Matter, Robert C.; and Spangler, Larry D., 4,015,098.

Spann, Michael M.: *See*—
Hoyer, Wilmer A.; and Spann, Michael M., 4,015,195.

Spector, Donald. Inflatable, chemi-luminescent assembly. 4,015,111, Cl. 240-2.250.

Spellman, Patrick Joseph: *See*—
Megahed, El Sayed; and Spellman, Patrick Joseph, 4,015,056.

Spengler, Ernst M., to Stanztechnik GmbH Roeder & Spengler. Cutting apparatus. 4,014,234, Cl. 83-162.000.

Spercel, Robert J. Guitar string tuning device. 4,014,239, Cl. 84-306.000.

Spicer, Larry Dean; and Hand, John James, to American Cyanamid Company. 6-Substituted amino phenyl-2,3,5,6-tetrahydro[2,1-b]thiazoles. 4,014,892, Cl. 260-306.70T.

Spiewok, Leonhard; and Bucher, Albert, to Escher Wyss Limited. Vertical centrifuge. 4,014,497, Cl. 233-20.00R.

Spinner, Ernest Elliott; and Slotsky, Myron Norton, to Marion Laboratories, Inc. Anaerobic culture collecting and transporting apparatus. 4,014,748, Cl. 195-127.000.

Spiro, Irving. Tennis elbow splint. 4,014,327, Cl. 128-165.000.

Spohn, Russel: *See*—
Ludlum, Lorren F., 4,014,288.

Sporyshev, Boleslav Viktorovich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.

Spotteck, Frederick P., to Raymond Lee Organization, Inc., The, a part interest. Electric tooth polisher. 4,014,100, Cl. 32-59.000.

Sprecher & Schuh AG: *See*—
Phillot, Charles; and Unterweger, Heinz, 4,015,178.

Staal, Gerardus B.: *See*—
Henrick, Clive A.; and Staal, Gerardus B., 4,014,922.

Stahlecker, Fritz: *See*—
Stahlecker, Hans, 4,014,162.

Stahlecker, Hans, to Stahlecker, Hans; and Stahlecker, Fritz. Fiber supply duct for an open-end spinning unit. 4,014,162, Cl. 57-58.950.

Stahlheber, Norman Earl, to Monsanto Company. Ether carboxylate monohydrate. 4,014,929, Cl. 260-535.00P.

Stahlheber, Norman Earl: *See*—
Feiler, William A.; and Stahlheber, Norman Earl, 4,014,930.

Stalker, Michael: *See*—
Nayler, Irene Mary; and Stalker, Michael, 4,014,454.

Stalley, Anthony Donald; and Bishop, Alan Martin, to Quantel Limited. Component cabinet. 4,014,598, Cl. 312-236.000.

Stamicarbon B.V.: *See*—
Adema, Eduard H.; Van Geenen, Albert A.; and Den Otter, Marinus J. A. M., 4,014,952.
Tebben, Johannes H.; and Weterings, Cornelis A. M., 4,014,818.
Tebben, Johannes H.; and Weterings, Cornelis A. M., 4,014,819.

Standard Oil Company: *See*—
Chipman, Gary R.; Henk, Michael G.; De Boer, Jacob A.; and Blaha, Eli W., 4,014,858.
Selover, Theodore B., Jr.; Boos, Donald L.; and Hacha, Thomas H., 4,014,730.
Zimmerschied, Wilford J.; Palmer, David A.; and Bertolacini, Ralph J., 4,014,945.

Standard Oil Company (Indiana): *See*—
Basalay, Robert J.; Pappas, Peter G.; and Edmisten, Walter C., 4,015,063.
Karayannis, Nicholas M.; Turner, James A.; and Lee, Sam S., 4,015,060.
Steigelmann, Edward F., 4,014,665.

Stange, Klaus K., to Xerox Corporation. Air floatation bottom feeder. 4,014,537, Cl. 271-166.000.

Stanztechnik GmbH Roeder & Spengler: *See*—
Spengler, Ernst M., 4,014,234.

Staodynamics, Inc.: *See*—
Halleck, Michael E.; and Thomson, Thomas H., 4,014,347.

Stark, Martin H. Propeller shaft liner and inserting apparatus. 4,014,184, Cl. 64-1.00V.

Starkweather, Gary K., to Xerox Corporation. Multifunction scanning system. 4,015,081, Cl. 358-206.000.

Staub, David Edward; Foltz, Carl Leroy; and Simmons, Raymond Walter, to Concept, Inc. Vitreous cutter. 4,014,342, Cl. 128-305.100.

Stauffer Chemical Company: *See*—
Hayati, Hossein; and Towers, Russell S., 4,014,703.
Kraft, Paul; and Altscher, Siegfried, 4,014,836.
Kraft, Paul; and Altscher, Siegfried, 4,014,837.
Kraft, Paul; and Altscher, Siegfried, 4,014,838.
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Muntz, Ronald L.; and Lerner, Robert W., 4,014,911.
Muntz, Ronald L.; and Lerner, Robert W., 4,014,912.

Stedman, Robert N.; and Moser, Raymond L., to Caterpillar Tractor Co. Paddle-type loading mechanism for refuse transport. 4,014,446, Cl. 214-520.000.

Steel Web Corporation: *See—*
Jackson, Edgar D., 4,014,404.

Steere, Robert E., Jr., to Silicon Technology Corporation. Hydraulic blade mount. 4,014,311, Cl. 125-15.000.

Steigelmann, Edward F., to Standard Oil Company (Indiana). Membrane process and product. 4,014,665, Cl. 55-16.000.

Stein Industrie S.A.: *See—*
Andro, Jean; and Peyrelongue, Jean-Pierre, 4,014,671.

Stein, Robert George: *See—*
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Steinberg, Albert H.: *See—*
Segal, Leon; and Steinberg, Albert H., 4,015,039.

Steinkamp, Jeffrey H. Scoring apparatus. 4,014,546, Cl. 273-102.20S.

Stepek, Walter Joseph: *See—*
Garber, Murray; Ross, Lawrence James; and Stepek, Walter Joseph, 4,014,896.

Stephan, Gunter; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Water-insoluble azo-pyrimidine pigments. 4,014,863, Cl. 260-154.000.

Sternbach, Leo Henryk: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,014,916.
Fryer, Rodney Ian; Ning, Robert Ye-Fong; Sternbach, Leo Henryk; and Walser, Armin, 4,014,883.

Stetter, Hermann; and Schreckenberg, Manfred, to Bayer Aktiengesellschaft. Process for preparing ketones. 4,014,889, Cl. 260-294.900.

Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., to Dow Chemical Company, The. Linear copolymers of glycidol. 4,014,854, Cl. 260-47.0EQ.

Stevenson, Peter Alan; and Vogel, Stephen Martin, to International Business Machines Corporation. Flying head helical scan magnetic recording device employing a lobed rotor. 4,015,291, Cl. 360-102.000.

Stewart, John W., to NCR Corporation. Voltage compensated timing circuit. 4,015,145, Cl. 307-293.000.

Stewart, Leslie C., to Center for Communications Research, Inc. Spectrograph apparatus for analyzing and displaying speech signals. 4,015,087, Cl. 179-1.0SP.

Stock, Robert M.: *See—*
Swonger, Claron W.; Ryan, Hollis F.; Stock, Robert M.; and Vossler, Charles M., 4,015,240.

Stockel, Richard Frederick: *See—*
Barer, Sol Joseph; Stockel, Richard Frederick; and Valenti, Peter Carl, 4,015,008.

Stockinger, Friedrich; and Lohse, Friedrich, to Ciba-Geigy Corporation. Triglycidyl compounds and their use. 4,014,824, Cl. 260-2.0EC.

Stoddard, Donald J.: *See—*
Koerner, John A.; Scherer, James P.; Stoddard, Donald J.; and Voronoff, George N., 4,015,263.

Stolt, Nils Lennart, to Alfa-Laval AB. Method of heating heat exchanger unit. 4,014,383, Cl. 165-95.000.

Stomma, Thaddeus; and Wroblewski, Edwin J., to Allen-Bradley Company. Cartridge for magnetically operated contacts. 4,015,226, Cl. 335-206.000.

Storck, Eckhard: *See—*
Pekau, Dietlind; and Storck, Eckhard, 4,015,248.

Story, Augustus L., to Owens-Illinois, Inc. Aqueous printing ink with polyethylene oxide. 4,014,833, Cl. 260-29.2EP.

Strandh, Mix Tommy, to Malmo Testequipment AB. Multiconductor cable testing apparatus. 4,015,200, Cl. 324-51.000.

Strandt, Earl R., to General Motors Corporation. Keyboard encoding circuit utilizing an A/D converter. 4,015,254, Cl. 340-365.00S.

Strange, Carl P.: *See—*
Liu, Gordon Y. T.; and Strange, Carl P., 4,015,067.

Strasser, Hubert: *See—*
Hattenberger, Adolf; Lind, Walter; and Strasser, Hubert, 4,014,967.

Stube, Steven H.; and Chisholm, Douglas S., to Dow Chemical Company, The. Process for scrapless forming of plastic articles. 4,014,965, Cl. 264-23.000.

Stukachev, Anatoly Viktorovich: *See—*
Barakaev, Khristofor Fedorovich; Gilim, Alexandr Sergeevich; Stukachev, Anatoly Viktorovich; and Shulga, Robert Nikolaevich, 4,015,170.

Stumpf, Horst: *See—*
Gorter, Werner; Kresta, Erich; and Stumpf, Horst, 4,014,969.

Sturm, Walter H., to Original Hanau Quarzlampen GmbH. Apparatus for controlling the absorption of one or more color components contained in a textile dyeing fluid. 4,015,134, Cl. 250-565.000.

Sturt, Alan Charles: *See—*
Park, Anthony John; and Sturt, Alan Charles, 4,015,065.

Sudduth, Jerome R.: *See—*
Keyworth, Donald A.; and Sudduth, Jerome R., 4,014,950.

Sugino, Hiromu: *See—*
Kakinuma, Atsushi; Sugino, Hiromu; Moriya, Norihiko; and Isono, Masao, 4,014,860.

Sugiyama, Hiroshi: *See—*
Hatori, Yukiyoshi; and Sugiyama, Hiroshi, 4,014,268.

Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, to Yamakawa Industry Company Ltd.; and Nifco Inc. Strainer. 4,014,796, Cl. 210-437.000.

Sugiyama, Noboru; Watanabe, Yoshitugu; and Yamamoto, Hiroshi, to Koike Sanso Kogyo Co., Ltd. Gas cutting machine. 4,014,528, Cl. 266-66.000.

Sukegawa, Tokuzo: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,015,284.

Suling, Carlhans: *See—*
Miessen, Ralf; Blankenstein, Gunter; Korte, Siegfried; and Suling, Carlhans, 4,014,958.

Sultan, Stig Bertil, to Facit Aktiebolag. Printing head for use with an ink jet printer. 4,015,271, Cl. 346-140.00R.

Sumimoto, Shinzaburo; Tochino, Yoshihiro; and Fujimoto, Manabu, to Shionogi & Co., Ltd. Isoxazole derivatives. 4,014,876, Cl. 260-247.20A.

Sumitomo Chemical Company, Limited: *See—*
Aoki, Yasuhiko; Suzuki, Hiroyuki; Akiyama, Hisao; and Okano, Shigeru, 4,014,895.
Ume, Yoshitaka; Matsuo, Takashi; Itaya, Nobushige; and Ohno, Nobuo, 4,014,940.

Sun Oil Company: *See—*
Hensel, Wilber M., Jr., 4,014,393.

Sun Ventures, Inc.: *See—*
Hedge, John A., 4,014,949.

Sunburst Solar Energy, Inc.: *See—*
Newton, T. Lawrence, 4,014,314.

Sury, Yel S.: *See—*
Balke, David E.; Perez, Donald E.; and Sury, Yel S., 4,014,879.

Sutter, David L., to Hussey Manufacturing Company, Inc. Permanently fixed end rails on telescopic bleacher seats. 4,014,522, Cl. 256-59.000.

Suzuki, Hiroyuki: *See—*
Aoki, Yasuhiko; Suzuki, Hiroyuki; Akiyama, Hisao; and Okano, Shigeru, 4,014,895.

Suzuki, Kazuo; Nanao, Tsutomu; and Miyazaki, Hiroshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electron beam cured intumescent coating composition. 4,014,770, Cl. 204-159.140.

Suzuki, Koji: *See—*
Karube, Yukuo; Suzuki, Koji; and Ezaki, Ryoichi, 4,015,181.

Suzuki, Morio: *See—*
Nagata, Takashi; Motoki, Goro; Suzuki, Morio; and Yoshino, Hiroshi, 4,015,066.

Suzuki, Shuei: *See—*
Sato, Kuniaki; Toyama, Kozo; MAtsushita, Eiji; Tomita, Akio; and Suzuki, Shuei, 4,014,089.

Suzuki, Yasuhiro; Okamoto, Toshihide; Noda, Yuzuru; and Kojima, Makoto, to Nitto Electric Industrial Co., Ltd. Heat resistant resin solution and method for preparation thereof. 4,014,832, Cl. 260-29.20N.

Suzuki, Yoshiro. Multiple switch assembly for electrically operated instrument. 4,015,092, Cl. 200-5.00R.

Svarz, Jerry J.; Goretta, Louis A.; and Seale, Virgil L., to Nalco Chemical Company. Method of making a Raney copper catalyst and the catalyst so made. 4,014,820, Cl. 252-463.000.

Svoboda, Josef: *See—*
Weigl, Erwin; and Svoboda, Josef, 4,014,563.

Swanson, David L.; and Walter, Robert C., to Warner Electric Brake & Clutch Company. Electrically controlled brake with improved anti-rotation bracket for magnet. 4,014,412, Cl. 188-138.000.

Swartz, Delbert D.: *See—*
Hadley, John R.; LeBrun, Michel A., Jr.; McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,014,449.

Swenson, Richard F., to Milsco Manufacturing Company. Seat supporting assembly. 4,014,507, Cl. 248-407.000.

Swett, Leo Ralph; Stein, Robert George; and Carter, George William, to Abbott Laboratories. Acylphosphonate esters. 4,014,997, Cl. 424-200.000.

SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Jurowski, Willi; Kohler, Alfred; Prohaska, Hans; and Schrade, Eugen, 4,014,061.

Swiss Aluminium Ltd.: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 4,014,417.

Swofford, Aubrey L., to Engineering Concepts, Inc. Combined trailer-camper unit. 4,014,586, Cl. 296-23.00A.

Swonger, Claron W.; Ryan, Hollis F.; Stock, Robert M.; and Vossler, Charles M., to Calspan Corporation. Pattern recognition apparatus. 4,015,240, Cl. 340-146.30E.

Symanski, Jerome J., to United States of America, Navy. High speed serial data synchronization scheme. 4,015,252, Cl. 340-347.0DD.

Syntex Puerto Rico, Inc.: *See—*
Mathes, Stanley, 4,014,336.

Systems Engineering & Manufacturing Corporation: *See—*
Shorr, Jacob, 4,014,787.

Szczesniak, Alina Surmacka, to General Foods Corporation. Hydrocolloids as potentiators of dimethyl sulfide flavor. 4,015,025, Cl. 426-575.000.

Szechenyi, Kalman: *See—*
Gasser, Lorenz; and Szechenyi, Kalman, 4,015,190.

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Taira, Shigenobu: *See—*
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Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, 4,014,102.

Takada, Shigeho: *See—*
Aihara, Mitsuo; Takada, Shigeho; and Ogawa, Hisaharu, 4,015,146.

Takahashi, Akira; and Furukawa, Masamichi, to Ricoh Co., Ltd. Memory device of an electrical shutter for single lens reflex camera. 4,015,274, Cl. 354-23.00D.

Takahashi, Masaaki: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, 4,014,758.

Takase, Mituo; Inoue, Hisao; Hachiya, Takeo; and Seno, Katsumi, to Hitachi, Ltd. Method and device for starting pump. 4,014,624, Cl. 415-1.000.

Takashima, Masaru, to Aikoh Co., Ltd. Tundish for the continuous casting of steel. 4,014,531, Cl. 266-280.000.

Takatani, Masayoshi; and Amaya, Yuji, to Fujitsu Ten Ltd. Vehicle alarm system. 4,015,237, Cl. 340-52.00F.

Takazawa, Yuzuru: *See*—
Nagaoka, Shinji; and Takazawa, Yuzuru, 4,015,142.

Takeda Chemical Industries, Ltd.: *See*—
Kakinuma, Atsushi; Sugino, Hiromu; Moriya, Norihiko; and Isono, Masao, 4,014,860.
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Takeda, Hiromu: *See*—
Watanabe, Noritoshi; Fujita, Seigoro; Shibata, Kazuo; Iwawaki, Shiho; and Takeda, Hiromu, 4,015,043.

Takeda, Masao: *See*—
Seno, Shougo; and Takeda, Masao, 4,015,231.

Takei, Hartuo: *See*—
Hinata, Masanao; Ohki, Masanaga; Takei, Hartuo; Sato, Akira; and Ogawa, Akira, 4,014,702.

Takeuchi, Takeshi: *See*—
Inoue, Yoshikatsu; and Takeuchi, Takeshi, 4,015,074.

Takezoe, Fumihiko, to Fuji Electric Company Ltd. Information processing system. 4,015,241, Cl. 340-147.0SC.

Takishima, Yoshiyuki: *See*—
Tsunekawa, Tokuichi; Uchidoi, Masanori; Taguchi, Tetsuya; Takishima, Yoshiyuki; Ito, Tadashi; and Aizawa, Hiroshi, 4,015,149.

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Tamura, Yoshitaka: *See*—
Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; and Mizota, Teruhiko, 4,015,020.

Tanaka, Hitoshi; Masumura, Hitoshi; and Fujiwara, Shinobu, to TDK Electronics Company, Limited. Ceramic dielectric composition. 4,014,707, Cl. 106-73.310.

Tanaka, Kazuaki; Ishida, Yasuto; Yanagi, Kimiyoshi; Kassai, Noriaki; and Tanaka, Toshiyuki, to Kyowa Yuka Co., Ltd. Method of producing α,β-unsaturated ether. 4,014,941, Cl. 260-614.00R.

Tanaka Kogyo Kabushiki Kaisha: *See*—
Muto, Goro, 4,014,402.

Tanaka, Masanobu: *See*—
Eda, Kazuo; Tanaka, Masanobu; Kajita, Harumasa; Ishida, Mikio; and Matsuoka, Michio, 4,015,228.

Tanaka, Sadao; Endo, Kiyosi; and Karakawa, Fumio, to Sony Corporation. Motor and method for making same. 4,015,154, Cl. 310-42.000.

Tanaka, Shinichi; Sano, Kenji; and Kimura, Seiji, to Sharp Kabushiki Kaisha. Weighted pulse signal count system. 4,015,107, Cl. 235-61.60R.

Tanaka, Toshiyuki: *See*—
Tanaka, Kazuaki; Ishida, Yasuto; Yanagi, Kimiyoshi; Kassai, Noriaki; and Tanaka, Toshiyuki, 4,014,941.

Tanaka, Yutaka: *See*—
Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,014,842.

Tangen Drives, Inc.: *See*—
Walle, Irwin, 4,014,429.

Tanikawa, Yukio. Bat used in baseball. 4,014,542, Cl. 273-72.00R.

Tanner, John: *See*—
Crosby, John; Rennie, Robert Allan Campbell; Tanner, John; and Paton, Robert Michael, 4,014,893.

Tapmatic Corporation: *See*—
Johnson, Allan S., 4,014,421.

Tarnacki, Edward Joseph. Paint brush holder. 4,014,453, Cl. 220-90.000.

Tarui, Yasuo: *See*—
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Tatami, Mitsushige: *See*—
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Tatsumichi, Toshio: *See*—
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Tatsuno, Kenzou: *See*—
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Tatsuo, Utsumi: *See*—
Shigeyoshi, Miyamoto; Kosuke, Yamashita; Kunihisa, Fujiwara; and Tatsuo, Utsumi, 4,014,641.

Taub, Bernard, to Allied Chemical Corporation. Aerosol latex paint containing cationic surfactants. 4,014,841, Cl. 260-29.6MN.

Taylor, Bruce C., to Akron City Hospital. Apparatus and method for monitoring air emboli during extracorporeal circulation. 4,014,206, Cl. 73-19.000.

Taylor, James O., to Florida Pneumatic Manufacturing Corporation. Pneumatically actuated sanding tool. 4,014,249, Cl. 91-32.000.

Taylor, Lynn J.: *See*—
Grier, John D.; and Taylor, Lynn J., 4,014,845.

Taylor, Wallace N. Shoe sole cleaner. 4,014,060, Cl. 15-36.000.

TDK Electronics Company, Limited: *See*—
Tanaka, Hitoshi; Masumura, Hitoshi; and Fujiwara, Shinobu, 4,014,707.

Tebben, Johannes H.; and Weterings, Cornelis A. M., to Stamicarbon B.V. High surface area catalyst compositions. 4,014,818, Cl. 252-451.000.

Tebben, Johannes H.; and Weterings, Cornelis A. M., to Stamicarbon B.V. Nickel catalyst. 4,014,819, Cl. 252-459.000.

Techer, Henri: *See*—
Pesson, Marcel; and Techer, Henri, 4,015,002.

Teixeira, Antone S. Beach cleaner apparatus. 4,014,390, Cl. 171-124.000.

Teleflex Morse Limited: *See*—
Hemens, James Frederick; and Eastty, Alan John, 4,014,136.
Hemens, James Frederick, 4,014,281.

Telefonaktiebolaget L M Ericsson: *See*—
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Tennant Company: *See*—
Herpers, Ferdinand J., Jr.; and Untiedt, Daniel I., 4,014,808.

Tenneco Chemicals, Inc.: *See*—
Feldman, Martin L.; and Miller, Robert S., 4,015,064.
Keyworth, Donald A.; and Sudduth, Jerome R., 4,014,950.

Terada, Fumio; Matsuda, Yoshio; and Yamaguchi, Yoshiharu, to Yoshida Kogyo Kabushiki Kaisha. Warp knitted foundation for sliding clasp fasteners. 4,014,190, Cl. 66-195.000.

Terada, Ziro: *See*—
Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, 4,015,230.

Terashima, Isamu, to Hitachi, Ltd. Developing apparatus for electrophotographic color copying apparatus. 4,014,608, Cl. 355-4.000.

Terni Societa per l'Industria e l'Elettricita S.p.A.: *See*—
Barisoni, Mario; Barteri, Massimo; Bitti, Roberto Ricci; Brozzo, Pietro; and Marianeschi, Edmondo, 4,014,717.

Tesarik, Karel; and Krejci, Milos, to Ceskoslovenska akademie ved. Detecting apparatus for liquid chromatography. 4,014,793, Cl. 210-198.00C.

Tesk, John A.: *See*—
Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., 4,014,690.

Tetsugu, Yoshio; Mitsui, Tsunemi; and Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Speed regulating devices for rotary machines or the like. 4,015,180, Cl. 318-314.000.

Teufel, Karl Heinz. Variable frame for the reception of naturally stiff display articles. 4,014,119, Cl. 40-152.000.

Texaco Development Corporation: *See*—
Paull, Peter L.; and Caffrey, James M., Jr., 4,014,982.

Texaco Inc.: *See*—
Barnes, Vernon M., Jr.; Flournoy, Norman E.; and Horton, Eugene B., Jr., 4,015,270.
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,014,661.
McCoy, Drew E., 4,014,780.
Potter, Clyde E.; and Richter, George N., 4,014,786.

Texas Instruments Incorporated: *See*—
Barton, Troyce D., 4,014,165.
Kendall, Don L.; Ahlburn, Byron F.; and Wiemer, Klaus C., 4,015,175.
Senor, Ronald E.; and Perry, Frederick G., 4,015,229.

Textron, Inc.: *See*—
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Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Apparatus for winding continuous threads or yarns. 4,014,476, Cl. 242-19.000.
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B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
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B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
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B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,50[illegible]	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977	B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barthelemy, Gabriel: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, to Hoffmann-La Roche Inc. 1,2,3,4,10,19-Hexanor-9-oxo-5,9-seco-25D-spirostan-5-oic acid. Re. 29,163, Cl. 260-345.700.

Bode, George Fred. Electromotive device including magnetic shield interacting with permanent magnet pole faces. Re. 29,165, Cl. 310-46.000.

Bristol-Myers Company: *See—*
Crast, Leonard Bruce, Jr., Re. 29,164.

Cinquanta, Alain: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

Compagnie Francaise de Raffinage: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

Crast, Leonard Bruce, Jr., to Bristol-Myers Company. 7-Amino-cephalosporanic and decephalosporanic acid derivatives. Re. 29,164, Cl. 260-243.00C.

Doyotte, Claude Charles: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

Drapeau, Yves: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, to Compagnie Francaise de Raffinage. Devices for the generation of ultrasonics and their application to the preparation of emulsions. Re. 29,161, Cl. 259-4.00R.

Els, Hans: *See—*
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.

Forster, Friedrich M. O. Magnetic flaw detector system for reciprocating pairs of leakage field detectors with means for adjusting the spacing between each pair of detectors. Re. 29,166, Cl. 324-37.000.

Hoffmann-La Roche Inc.: *See—*
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.

Jaffa, David, to Precision Screen Machines Inc. Screen printing machine with oval rail for indexing pallets. Re. 29,160, Cl. 101-123.000.

McLennan, Lyall A. Abutment swivel doorstop. Re. 29,162, Cl. 292-67.000.

Precision Screen Machines Inc.: *See—*
Jaffa, David, Re. 29,160.

Schocher, Arno Johannes: *See—*
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.

Seguela, Claude Jean-Marie: *See—*
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

LIST OF PLANT PATENTEES

Moore, Ralph S. Miniature rose plant. 4,026, 3-29-77, Cl. 9.000.

Moore, Ralph S. Rose plant. 4,027, 3-29-77, Cl. 10.000.

Moore, Ralph S. Miniature rose plant. 4,028, 3-29-77, Cl. 8.000.

Moore, Ralph S. Miniature rose plant. 4,029, 3-29-77, Cl. 7.000.

Moore, Ralph S. Rose plant. 4,030, 3-29-77, Cl. 10.000.

Moore, Ralph S. Rose plant. 4,031, 3-29-77, Cl. 9.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See—*
Lehn, Russell Frederick, 243,831.

Achenbach, Walter B., to Owens-Illinois, Inc. Beverage glass or similar article. 243,816, 3-29-77, Cl. D7-15.000.

Adams, James T. Ducted fan aircraft. 243,837, 3-29-77, Cl. D12-79.000.

Akazawa, Toshimasa, to Matsushita Electric Industrial Co., Ltd. Transceiver. 243,861, 3-29-77, Cl. D14-68.000.

Anderson, John W. Headlight bezel. 243,880, 3-29-77, Cl. D48-32.00C.

Arnold, Robert A. Pneumatic paint stirring apparatus. 243,881, 3-29-77, Cl. D15-147.000.

Arvai, Tibor, to Tokyo Juki Kogyo Kabushiki Kaisha. Sewing machine. 243,841, 3-29-77, Cl. D15-69.000.

Avise, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, to Dazey Products Company. Can opener. 243,819, 3-29-77, Cl. D8-36.000.

Becker, Julius C., to Becker Manufacturing Company, Incorporated. Pig feeder. 243,864, 3-29-77, Cl. D30-13.000.

Becker Manufacturing Company, Incorporated: *See—*
Becker, Julius C., 243,864.

Berlin & Jones Company, Inc.: *See—*
Watson, Charles S., 243,846.

Bottcher, Charles E. Green bean and pea sheller. 243,818, 3-29-77, Cl. D7-153.000.

Cade, J. Robert; and Raulerson, James D. Female urinary device or the like. 243,883, 3-29-77, Cl. D83-1.00U.

Cartier, Inc.: *See—*
Durante, Alfred Joseph, 243,836.

Castiglioni, Achille. Light fixture. 243,876, 3-29-77, Cl. D48-20.00R.

Christian Dior, S.A.R.L.: *See—*
Teufelhart, Elfriede, 243,845.

Cloyd, Robert K. Drinking straw. 243,817, 3-29-77, Cl. D7-42.000.

Colibri Lighters Ltd.: *See—*
Lowenthal, Hans, 243,863.

Continental Scale Corporation: *See—*
Hutchinson, William Y.; and Kushmuk, Walter P., 243,835.

Davenport, Richard L., to S. C. Johnson & Son, Inc. Dispenser for a toilet bowl disinfectant. 243,850, 3-29-77, Cl. D23-150.000.

Dazey Products Company: *See—*
Avise, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, 243,819.

Dickson, Curtis G. Decorative night light. 243,877, 3-29-77, Cl. D48-20.00E.

Dow Chemical Company, The: *See—*
Hutter, Wayne R.; and Miller, John Andrew, 243,826.

Drackett Company, The: *See—*
Jones, David A.; and Goyert, Philip R., 243,830.

Driscoll, James A. Spare tire mount for trailers. 243,839, 3-29-77, Cl. D12-202.000.

Dunlop Limited: *See—*
Shaw, Michael; and Haines, Robert Christopher, 243,866.

Durante, Alfred Joseph, to Cartier, Inc. Bracelet. 243,836, 3-29-77, Cl. D11-12.000.

Edwards, Gerald D. Tooth for power digger. 243,843, 3-29-77, Cl. D15-29.000.

Ejchorszt, Olgierd Z. Roof screen support system. 243,853, 3-29-77, Cl. D25-43.000.

Eschendal, Herbert: *See—*
Underwood, Ray L.; and Eschendal, Herbert, 243,804.

Fabbrica Italiana Lapis Ed Affini (FILA) S.p.A.: *See—*
Rho, Enea, 243,886.

Felter, John V. Ventilator. 243,851, 3-29-77, Cl. D23-153.000.

Fenlin, John M. Shoulder prosthesis. 243,884, 3-29-77, Cl. D83-1.00E.

Fenlin, John M. Shoulder prosthesis. 243,885, 3-29-77, Cl. D24-33.000.

Fine, Leonard, to General Electric Company. Wall plate. 243,824, 3-29-77, Cl. D8-353.000.

Frame, Paul W., Jr. Plastic insert for examining table stirrup. 243,882, 3-29-77, Cl. D24-7.000.

Fratelli Saporiti: *See—*
Introini, Vittorio, 243,810.
Radaelli, Ernesto, 243,806.

Gafnea, Rickey W. Visor for vehicles or the like. 243,840, 3-29-77, Cl. D12-191.000.

Gardisette International AG: *See—*
Schroeder, Peter E., 243,871.

General Electric Company: *See—*
Fine, Leonard, 243,824.
Grieb, Joan, 243,821.
Grieb, Joan, 243,822.
Grieb, Joan, 243,823.
Levin, Monte; and Grieb, Joan, 243,887.
Levin, Monte L., 243,825.

Goyert, Philip R.: *See—*
Jones, David A.; and Goyert, Philip R., 243,830.

Grieb, Joan, to General Electric Company. Wall plate. 243,821, 3-29-77, Cl. D8-350.000.

Grieb, Joan, to General Electric Company. Wall plate. 243,822, 3-29-77, Cl. D8-351.000.

Grieb, Joan, to General Electric Company. Wall plate. 243,823, 3-29-77, Cl. D8-351.000.

Grieb, Joan: *See—*
Levin, Monte; and Grieb, Joan, 243,887.

Haines, Robert Christopher: *See—*
Shaw, Michael; and Haines, Robert Christopher, 243,866.

Hansen, Gerry, to Richton International Corporation. Jewelry display cabinet. 243,811, 3-29-77, Cl. D6-172.000.

Helm, Richard K. Hanging container for potted plants. 243,808, 3-29-77, Cl. D6-113.000.

Hendrixson, Hal. Bar or similar article. 243,809, 3-29-77, Cl. D6-144.000.

Henry, Franklin H. Wardrobe systemizer device. 243,815, 3-29-77, Cl. D6-257.000.

Hickman Designs Limited: *See—*
Hickman, Ronald Price, 243,820.

Hickman, Ronald Price, to Hickman Designs Limited. Extension arm for a vise. 243,820, 3-29-77, Cl. D8-74.000.

Holcomb, Jack N. Battery comparator educational board. 243,847, 3-29-77, Cl. D19-64.000.

Hori, Kiyoshi, to Nippon Paint Co., Ltd. Building board. 243,857, 3-29-77, Cl. D25-80.000.

Hutchinson, William Y.; and Kushmuk, Walter P., to Continental Scale Corporation. Height measuring device. 243,835, 3-29-77, Cl. D10-71.000.

Hutter, Wayne R.; and Miller, John Andrew, to Dow Chemical Company, The. Bottle or similar article. 243,826, 3-29-77, Cl. D9-53.000.

Hynes, Paul Thomas. Building brick. 243,855, 3-29-77, Cl. D25-87.000.

Introini, Vittorio, to Fratelli Saporiti. Table. 243,810, 3-29-77, Cl. D6-177.000.

Johansen, Victor: *See—*
Leon, Burke; Johansen, Victor; Rose, Peter; and Rolih, Gary, 243,842.

Jones, David A.; and Goyert, Philip R., to Drackett Company, The. Cleaning composition container. 243,830, 3-29-77, Cl. D9-157.000.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Yajima, Yozo, 243,890.

Kaprinyak, Julius. Lamp. 243,878, 3-29-77, Cl. D48-20.00C.

Keepper, David Edgar: *See—*
Avise, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, 243,819.

Kushmuk, Walter P.: *See—*
Hutchinson, William Y.; and Kushmuk, Walter P., 243,835.

Laroye, Eric. Chair. 243,805, 3-29-77, Cl. D6-30.000.

Laut, Stanley. Game target. 243,865, 3-29-77, Cl. D34-5.0PP.

Leeder, Harry A., to R. E. Dietz Company. Siren horn housing. 243,834, 3-29-77, Cl. D10-120.000.

Lehn, Russell Frederick, to Abbott Laboratories. Compartmented container. 243,831, 3-29-77, Cl. D9-184.000.

Leon, Burke; Johansen, Victor; Rose, Peter; and Rolih, Gary, to Philip A. Hunt Chemical Corporation. Spray etcher for work pieces in which the work pieces first move into the etcher in one direction and then leave the etcher in a reverse direction. 243,842, 3-29-77, Cl. D15-199.000.

Lessard, Clermont: *See—*
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Lever Brothers Company: *See—*
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Ruriani, Salvatore, 243,828.
Ruriani, Salvatore, 243,829.

Levin, Monte; and Grieb, Joan, to General Electric Company. Wall plate-bamboo. 243,887, 3-29-77, Cl. D8-351.000.

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Lowenthal, Hans, to Colibri Lighters Ltd. Cover for cigarette lighter. 243,863, 3-29-77, Cl. D27-36.000.

Markert, Herman Rupert, to Sonoco Products Company. End closure for a container. 243,833, 3-29-77, Cl. D9-255.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
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Mendelson, Lewis Aaron: *See—*
Avise, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, 243,819.

Miller, John Andrew: *See—*
Hutter, Wayne R.; and Miller, John Andrew, 243,826.

Mitjans, Jose Figueras. Adjustable chair frame. 243,814, 3-29-77, Cl. D6-192.000.

Nippon Paint Co., Ltd.: *See—*
Hori, Kiyoshi, 243,857.

O'Connell, Robert Daniel. Lamp base. 243,879, 3-29-77, Cl. D48-20.00R.

Ouimet, Roger; and Lessard, Clermont. Chimney cowl. 243,852, 3-29-77, Cl. D23-154.000.

Owens-Corning Fiberglas Corporation: *See—*
Seymour, Merritt W.; and Tompkins, David D., 243,849.

Owens-Illinois, Inc.: *See—*
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Shveda, Andrew P., 243,832.

Pace Collection Inc., The: *See—*
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Palmer, Alvin Earl. Chair. 243,807, 3-29-77, Cl. D6-78.000.

Panek, George J. Accessory cover for protecting an air conditioner from solar radiation. 243,856, 3-29-77, Cl. D23-163.000.

Pelkey, Donald A. Boat steps. 243,854, 3-29-77, Cl. D25-63.000.

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Pratt, Marion. Credenza. 243,812, 3-29-77, Cl. D6-172.000.

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Price, Benjamin W. Cigar-shaped fishing lure. 243,848, 3-29-77, Cl. D22-27.000.

R. E. Dietz Company: *See—*
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Radaelli, Ernesto, to Fratelli Saporiti. Chair. 243,806, 3-29-77, Cl. D6-56.000.

Raulerson, James D.: *See—*
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Rho, Enea, to Fabbrica Italiana Lapis Ed Affini (FILA) S.p.A. Cosmetic pencil or the like. 243,886, 3-29-77, Cl. D28-7.000.

Richton International Corporation: *See—*
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Ricono, Beverly L.: *See—*
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Rolih, Gary: *See—*
Leon, Burke; Johansen, Victor; Rose, Peter; and Rolih, Gary, 243,842.

Rose, Peter: *See—*
Leon, Burke; Johansen, Victor; Rose, Peter; and Rolih, Gary, 243,842.

Ruriani, Salvatore, to Lever Brothers Company. Bottle or similar article. 243,827, 3-29-77, Cl. D9-149.000.

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S. C. Johnson & Son, Inc.: *See—*
Davenport, Richard L., 243,850.

Samet, Sylvia L. Yarn holder. 243,802, 3-29-77, Cl. D3-19.00R.

Schroeder, Peter E., to Gardisette International AG. Curtain fabric. 243,871, 3-29-77, Cl. D47-6.00E.

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Schwartz, Sheldon D. Light bulb reflector. 243,875, 3-29-77, Cl. D48-16.00D.

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Shaw, Michael; and Haines, Robert Christopher, to Dunlop Limited. Golf ball. 243,866, 3-29-77, Cl. D34-5.0QQ.

Shveda, Andrew P., to Owens-Illinois, Inc. Combined cup and token or the like. 243,832, 3-29-77, Cl. D9-193.000.

Simpson, Peyton G., Jr. Portable stereo tape player. 243,860, 3-29-77, Cl. D14-5.000.

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Skold, Leif Erik, to Svenska Utvecklings AB (SUAB), Swedish Na-

tional Development Co. Frame for battery electrodes. 243,858, 3-29-77, Cl. D13-10.000.
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Smith, Alvin T. Carrying case for a tennis racket and accessories. 243,888, 3-29-77, Cl. D87-1.00R.
Smith, Eugene P. Wall-mounted candle stick assembly. 243,874, 3-29-77, Cl. D48-2.000.
Sonoco Products Company: *See*—
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Svenska Utvecklings AB (SUAB), Swedish National Development Co.: *See*—
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Skold, Leif Erik, 243,859.
Teufelhart, Elfriede, to Christian Dior, S.A.R.L. Eyeglass frame. 243,845, 3-29-77, Cl. D16-65.000.
Tokyo Juki Kogyo Kabushiki Kaisha: *See*—
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Tompkins, David D.: *See*—
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Towne, Martin C. Ring. 243,870, 3-29-77, Cl. D4-26.000.
Underwood, Ray L.; and Eschendal, Herbert. Garment rack. 243,804, 3-29-77, Cl. D6-29.000.
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Waters, William D.: *See*—
Walters, William D., 243,889.
Watson, Charles S., to Berlin & Jones Company, Inc. Envelope. 243,846, 3-29-77, Cl. D19-3.000.
Williams, Albert J., Jr. Golf range finder. 243,867, 3-29-77, Cl. D34-5.0CB.
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CLASSIFICATION OF PATENTS

ISSUED MARCH 29, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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2	4,014,044
51	4,014,045
60	4,014,046
206	4,014,047
413	4,014,048

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159	4,014,054
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252 R	4,014,053

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138	4,014,648
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9 R	4,015,069

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104.04	4,014,062
111	4,014,063
159 A	4,014,064
250.42	4,014,061
	4,014,066
306 R	4,014,065
320	4,014,067
355	4,014,068

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90	4,014,070
93 R	4,014,071
95 R	4,014,072
105	4,014,073
135	4,014,074
140	4,014,069

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CLASS 19

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CLASS 23

230 B	4,014,649
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230.6	4,014,651
253 R	4,014,652
259	4,014,653
259.5	4,014,654
266	4,014,655
273 SP	4,014,656
288 R	4,014,657
292	4,014,658

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132 R	4,014,078
201 HE	4,014,079
230 R	4,014,080

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46	4,014,083
72.11	4,014,084
72.14	4,014,085

CLASS 29

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183.5	4,014,660
407	4,014,088
526	4,014,089
527.4	4,014,090
592	4,014,091
604	4,014,092
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20	4,014,097
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152	4,014,119
152.1	4,014,120
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23	4,014,129
27.4	4,014,127
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17	4,014,133
84	4,014,134
86	4,014,135

CLASS 48

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CLASS 49

321	4,014,137
325	4,014,136
367	4,014,138

CLASS 51

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109 R	4,014,140
165 R	4,014,141
165.77	4,014,142

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90	4,014,143
157	4,014,144
199	4,014,145
211	4,014,146
249	4,014,147
403	4,014,148
456	4,014,149
461	4,014,150
587	4,014,151
588	4,014,152

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21 FC	4,014,153
29	4,014,154
32	4,014,155
34	4,014,156
35	4,014,157
167	4,014,158

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17	4,014,666
32	4,014,667
90	4,014,668
257 PV	4,014,669
274	4,014,670
325	4,014,671
357	4,014,672
396	4,014,673

CLASS 56

202	4,014,159
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CLASS 57

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23 BA	4,014,164
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130 E	4,014,167

CLASS 60

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290	4,014,169
529	4,014,170
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650	4,014,172

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53.52	4,014,174
72.6	4,014,175
87	4,014,176
	4,014,177
110	4,014,180

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88	4,014,179
114	4,014,181
117	4,014,182
476	4,014,183

CLASS 64

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177	4,014,188
187	4,014,189
195	4,014,190

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77	4,014,192
288	4,014,193
313	4,014,194
379 R	4,014,195

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67	4,014,676
92	4,014,677
94	4,014,678
118	4,014,679

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92	4,014,197
249	4,014,198
294	4,014,199
315	4,014,200
316	4,014,196
332	4,014,201
402	4,014,202
427	4,014,203
465	4,014,204

CLASS 73

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19	4,014,206
67.8 S	4,014,207
67.9	4,014,208
119 R	4,014,209
194 A	4,014,210
	4,014,211
267	4,014,212
290 R	4,014,213
330	4,014,214
371	4,014,215
421.5 R	4,014,216
432 R	4,014,217

CLASS 74

474	4,014,218
492	4,014,219
522	4,014,220
665 GA	4,014,221
687	4,014,222
688	4,014,223
805	4,014,224

CLASS 75

.5 BA	4,014,680
12	4,014,681
29	4,014,682
49	4,014,683
51	4,014,684
	4,014,685
58	4,014,686
67 R	4,014,687
123 B	4,014,688
129	4,014,689
165	4,014,690
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172 R	4,014,692

CLASS 81

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426	4,014,226

CLASS 82

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47	4,014,228

CLASS 83

16	4,014,229
86	4,014,230
100	4,014,231
144	4,014,232
156	4,014,233
162	4,014,234
565	4,014,235
745	4,014,236

CLASS 84

1.12	4,014,237
1.13	4,014,238
306	4,014,239
327	4,014,240
383 A	4,014,241
454	4,014,242

CLASS 85

5 P	4,014,245
49	4,014,244
74	4,014,243

CLASS 89

1.819	4,014,246
191 A	4,014,247

CLASS 91

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32	4,014,249
487	4,014,250

CLASS 93

1 R	4,014,251
35 R	4,014,252

CLASS 96

1 PS	4,014,695
1 R	4,014,693
	4,014,694
1.4	4,014,696
1.5	4,014,697
53	4,014,698
66.4	4,014,699
73	4,014,700
75	4,014,701
122	4,014,702

CLASS 98

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CLASS 99

450.6	4,014,254

CLASS 100

99	4,014,255
159	4,014,256

CLASS 101

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93.29	4,014,258
123	Re.29,160
183	4,014,259
212	4,014,260
230	4,014,261

CLASS 102

28 R	4,014,262
38	4,014,263
46	4,014,264
70 S	4,014,265

CLASS 104

162	4,014,266
172 C	4,014,267
247	4,014,268
250	4,014,269

CLASS 106

1	4,014,703
38.22	4,014,704
50	4,014,705
55	4,014,706
73.31	4,014,707
287 R	4,014,708
300	4,014,709
304	4,014,710

CLASS 108

111	4,014,270

CLASS 111

7	4,014,271
65	4,014,272

CLASS 112

3 R	4,014,273
	4,014,274
158 E	4,014,275
214	4,014,276
219 A	4,014,277
226	4,014,278

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144 R	4,014,281
270	4,014,279

CLASS 115

.5 E	4,014,282
70	4,014,283

CLASS 116

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131	4,014,285

CLASS 118

2	4,014,286
6	4,014,288
7	4,014,287
213	4,014,289
301	4,014,290
657	4,014,291

CLASS 119

1	4,014,292
3	4,014,293
157	4,014,294

CLASS 122

32	4,014,295
235 P	4,014,296

CLASS 123

8.09	4,014,297
8.27	4,014,298
25 P	4,014,299
30 C	4,014,300
32 SP	4,014,301
119 A	4,014,302
124 R	4,014,303
139 AQ	4,014,305
139 E	4,014,304
141	4,014,306
148 CC	4,014,309
148 E	4,014,308

CLASS 124

6	4,014,310
81	4,014,307

CLASS 125

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CLASS 126

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270	4,014,313
271	4,014,314
275 R	4,014,315
360 R	4,014,316

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2 A	4,014,321
2 F	4,014,322
2 R	4,014,319
2 Z	4,014,320
2.1 Z	4,014,323
46	4,014,324
57	4,014,325
145.6	4,014,326
165	4,014,327
214 R	4,014,328
	4,014,329
218 M	4,014,330
224	4,014,331
227	4,014,332
240	4,014,333
260	4,014,334
	4,014,335
266	4,014,336
278	4,014,337
287	4,014,338
	4,014,339
	4,014,340
	4,014,341
303.14	4,014,343
305.1	4,014,342
361	4,014,344
417	4,014,345
419 PS	4,014,346
422	4,014,347

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17 R	4,014,350
	4,014,351
21 R	4,014,352
173	4,014,353

CLASS 132

90	4,014,354

CLASS 134

30	4,014,355
63	4,014,356
102	4,014,357

CLASS 136

210	4,014,713

CLASS 137

1	4,014,358
78	4,014,359
118	4,014,360
122	4,014,361
196	4,014,362
218	4,014,363
271	4,014,364
549	4,014,365

CLASS 138

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89	4,014,367

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CLASS 140

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CLASS 141

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CLASS 144

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CLASS 148

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6.17 4,014,715
11.5 C 4,014,716
111 4,014,717
187 4,014,718

CLASS 149

19.7 4,014,719
19.8 4,014,720
108.6 4,014,721

CLASS 150

33 4,014,374

CLASS 156

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69 4,014,723
86 4,014,724
148 4,014,725
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205 4,014,727
244 4,014,728
275 4,014,729
331 4,014,730
350 4,014,731
380 4,014,732
446 4,014,733
459 4,014,734

CLASS 157

1.17 4,014,375

CLASS 159

13 A 4,014,735

CLASS 160

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186 4,014,377
4,014,378

CLASS 162

38 4,014,736
226 4,014,737
258 4,014,738
274 4,014,739
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CLASS 164

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CLASS 165

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104 S 4,014,384
167 4,014,385

CLASS 166

314 4,014,387
321 4,014,386

CLASS 169

37 4,014,388

CLASS 171

16 4,014,389
124 4,014,390

CLASS 172

13 4,014,391

CLASS 173

118 4,014,392

CLASS 174

52 R 4,015,070
52 S 4,015,071
92 4,015,072
148 4,015,073

CLASS 175

58 4,014,393
72 4,014,394
410 4,014,395

CLASS 176

19 EC 4,014,741

CLASS 177

169 4,014,396
200 4,014,397
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CLASS 178

66 R 4,015,082
69.1 4,015,083

CLASS 179

1 E 4,015,089
1 SC 4,015,088
1 SP 4,015,087
6 R 4,015,090
6.3 R 4,015,078
84 R 4,015,091

CLASS 180

8 C 4,014,399
9.2 R 4,014,400
22 4,014,401
33 D 4,014,402

CLASS 181

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CLASS 182

155 4,014,404
181 4,014,405
204 4,014,406

CLASS 186

1 C 4,014,407

CLASS 188

24 4,014,408
58 4,014,409
71.6 4,014,410
71.9 4,014,411
138 4,014,412
170 4,014,413
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196 D 4,014,415

CLASS 190

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CLASS 191

29 DM 4,014,417
45 R 4,014,418

CLASS 192

13 R 4,014,419
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48.91 4,014,421
67 R 4,014,422
106.2 4,014,423

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CLASS 195

28 R 4,014,742
31 R 4,014,743
103.5 K 4,014,745
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CLASS 198

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5 R 4,015,092
51.1 4,015,093
61.58 B 4,015,094
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129.43 4,014,765
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159.14 4,014,770
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180 R 4,014,772
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213 4,014,774
252 4,014,775
257 4,014,776
270 4,014,777
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CLASS 206

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63.3 4,014,433
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386 4,014,435
492 4,014,436

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40 4,014,781
130 4,014,782
255 4,014,783

CLASS 209

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23 F 4,014,787
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84 4,014,789
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114 4,014,791
123 4,014,792
198 C 4,014,793
199 4,014,794
242 R 4,014,795
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60 A 4,015,086
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65 4,014,859
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178 4,015,061
260 4,015,062
331 4,015,063

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D4—	26	243,870		42	243,817		184	243,831	D15—	29	243,843		33	243,885			243,872
D6—	27	243,803		153	243,818		193	243,832		69	243,841	D25—	43	243,853			243,873
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	30	243,805		74	243,820	D10—	71	243,835		199	243,842		80	243,857		16 D	243,875
	56	243,806		350	243,821		120	243,834	D16—	64	243,844		87	243,855		20 C	243,878
	78	243,807		351	243,822	D11—	12	243,836		65	243,845	D27—	32	243,862		20 E	243,877
	113	243,808			243,823		145	243,869	D19—	3	243,846		36	243,863		20 R	243,876
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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PLANT PATENTS

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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner